TABLE TALKS on DENTISTRY

R. Ottolengui

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TABLE TALKS ON DENTISTRY

Table Talks on Dentistry

BY

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AND EDITOR OF DENTAL ITEMS OF INTEREST

These Table Talks have been compiled, collated and correlated, from the material which has appeared consecutively during the past fifteen years, in the department entitled "Around the Table," in the monthly magazine "Dental Items of Interest," and they have been brought up to date by the addition of entirely new material wherever it has seemed necessary.

They also include opinions, discussions and descriptions of practical methods, contributed by 104 other dental practitioners and writers.

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To

MY WIFE

Whose constant encouragement and helpful advice have ever been the guiding inspiration of my professional endeavors

THIS BOOK IS GRATEFULLY DEDICATED

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PREFACE

THE short introductory paragraph, which appears on a later page, was written when this undertaking was first conceived. The completion of the work brings out the important fact that this book is unique in the literature of dentistry. Practically all others have titles which indicate the special departments of dentistry to which they are devoted. The man exclusively interested in only one branch of our profession, may thus confine his study and reading to text-books which appeal to his particular needs.

The title of this book, "Table Talks on Dentistry," indicates a tremendous range of subjects, and, in consequence, it has seemed needful to prepare rather elaborate indices and tables of contents, that the readers may readily find what may most appeal to them.

To this end we present first an, "Analytical Table of Contents." This is a digest of the various Talks, and by scanning these, it is hoped that the reader may find something to attract him personally.

Next, the "Index to Contributors," will give the names of the various writers whose contributions to the original text have been copied into these pages, as possessing special interest.

Then, for the convenience of the exclusive specialist, we have compiled an "Index to Dental Specialties." These subject heads have not been arranged alphabetically, but are given in the order in which they appear in the book. Thus the reader may use the Index as a guide to the consecutive study of any particular branch of dentistry.

At the end will be found a "Topical Index," in which no attempt has been made to list each topic wherever mentioned, attention being directed only to those pages in which something of practical importance may be found.

Whilst this is not a dental text-book in the ordinary sense of the word, since it contains little of fundamental teaching material, on the other hand it does contain what cannot be found in any text-book in existence, viz. the descriptions of special techniques which have been tested and found valuable by many men.

My life long friend, Dr. Frank T. Van Woert, once said to me; "I have never been in any dental office, however unimportant, but I have been able to see something new, and to learn something useful."

In like manner I venture to assert that no dentist, can read this book through, without profiting by the perusal, for be it remembered that no less than 104 dentists of experience are quoted in these pages.

To the general practitioner I would say, that, if he will just open this book at random, he will, I think, very likely find a Talk that will prove entertaining. Thus this book has been planned to meet the needs of the casual reader, or of the student of some special subject.

In conclusion let me express my gratitude to those members of the Round Table Club who have so loyally supported the original department in the magazine by their encouraging letters and practical contributions, and particularly to those 104 men whose material has so greatly helped to make this book "worth while."

R. Ottolengui.

80 West 40th Street
New York City.
October 1st, 1928.

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TABLE TALKS ON DENTISTRY

INTRODUCTORY AND EXPLANATORY

THE FOLLOWING PAGES, now presented in book form, have been compiled, collated and correlated from somewhat unique papers published monthly since 1914 in Items of Interest, later known as Dental Items of Interest. They appeared in a special department, entitled "Around the Table," and became commonly and widely known as "Table Talks," presumably occurring at meetings of the "Round Table Club." Members of the club were and still are mainly what might be termed, "corresponding members," and are scattered all over the world. Explanation of the origin and purpose of these "Talks" was adequately given in the first Talk, which is republished herein. It is hoped that the present reader will read this, and thus place himself **"en rapport"** with the Round Table Club and its methods.

I.

FOR YEARS we have wanted a new department in Items of Interest, but we have been very much in the position of the little girl whose father asked her, "What do you want Santa Claus to bring you for Christmas?" and who, after deep thought, replied: "I don't know whether to ask for a hobby-horse or a pearl necklace; but I guess I'll take the pearl necklace, because all the other children have hobby-horses, and I could ride theirs."

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THE LITTLE GIRL certainly was a wise one, and we can not go wrong if we adopt her philosophy. Don't see the connection? Suppose we make it plainer. We have already a number of departments which, analyzed, come to this; we have been publishing articles prepared especially for us; articles read before dental societies; discussions thereon; reports of clinics, and editorials. All of these are important, especially the articles prepared exclusively for us, to which, as the great political parties always say in their ante-election platforms, "we point with pride." But important as they have been, and will be, the material in these departments has been scientific, serious, sedate and sometimes lengthy. For some reason, which is difficult to analyze, a certain proportion of the dental profession apparently are not quite contented with a dental journal, unless they can find in it some "short" articles.

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IF WE PLACE our ear to the ground, Indian style, like a far cry across the dental desert we hear a demand for "short" articles. Not for practical articles; nor critical articles; nor humorous articles; nor

news articles; nor in fact any particular kind of articles, except just "short" articles. There seems to be an almost pathetic yearning in the breasts of many dentists for short articles. Paragraphs that can be read between portions at luncheon, and digested, or indigested, as the case may be, along with the crackers and cream.

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BUT WE ARE wandering from our mutton—hobby-horse rather. So let us flock back to that noble steed. Well, other editors evidently have played Indian, and have heard the ten thousand dentists crying for the ten-line thesis. And they have supplied the demand. This much-beloved hobby of the so-called busy dentist has been brought forth from various journalistic stables, and put through his paces before the ecstatic throng, variously caparisoned, and under numerous names, such as "Timely Topics," "Dental Dont's," "Practical Points," "Noteworthy Notes," etc., etc., and other alliterative aliases. But remove the blanket, and the blinders, and you will find this "Hobby" is always the same old horse.

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CONSEQUENTLY, like the little girl deciding about the Christmas present, we have concluded, if possible, to offer our readers, with the New Year, a different breed of equine. One that can trot around the track in just as short steps as the dear old "Hobby," but at a newer and faster pace.

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IN THIS CONNECTION you are probably wondering why this department is to be called "Around the Table." You observe that the title is not alliterative, and you wonder if, by lifting the new style of blanket, you would find that it hides the same little old animal. Well, you would not. You would discover that the time-honored "Hobby" has run his race, but that he has sired a promising colt—a prancing pony that will remind you of the pony-post horses of a hundred years ago, whose fleet feet carried the messages of the people to the far corners of the country. And it is our hope and belief that this swifter-moving son of a popular sire will make a good record carrying messages which, though perhaps short, will be as telegrams compared to letters, a compact expression of important facts.

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IN FURTHER ELUCIDATION let us explain more in detail why we have chosen the caption of this department. The scientists, investigators and writers of the profession naturally become widely known through their publications, and, as one might say, are "the big men in dentistry." Being big men, they write big papers; papers that occupy much space, and thus help to encourage the manufacturers of printer's ink, by using up their products. There is one curious fact

about these big writers. Of course they have big ideas, but often they use such big words, and so many of them, that really it takes a lot of a fellow's time to separate the big idea from the lengthy language. And this perhaps is the main factor in the etiology of the fever for few-words papers.

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OF COURSE the editors can find those big ideas, and could prune away the wordy weeds, so that the big idea might be as conspicuous as a date palm in a desert. And sometimes they do this, these editors, working in behalf of those short article cranks.

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AND THEN, after the little editor has weeded and pruned the big article, so that the big idea is really comprehensible to the ordinary mind, Lo! The Big Man, the author, sends in a wireless, reading, "Let me see proof before publication," and there you are. The editor knows right off what is coming. But hoping for the best, he sends the big man his diminished article, praying that he might forget what he had written in the first place. But no! The zealous typewriter (or is she a typewritist?) has furnished that author person with a carbon copy, and, by George, he misses all the words that the editor had removed, and, worse yet, he replaces them. And worse yetter still, he interpolates a few extra adjectives, conjunctions and exclamation points, just to make the language a little more lustrous, and the meaning a little less lucid.

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MOST OF THESE big men read their papers before societies. Now these big societies have big men of their own, and of course they must have a chance at the visitor's big idea, if only to show him how little, or how old (usually twenty years old), or how useless it is. These local big men are all down on the programme, and are called on as soon as the visiting essayist stops reading his paper, and very often a local man's talk is twice as long as the paper. Usually there are two or three of these local professional discussionists on the programme of the evening, and by the time they finish up their "few remarks," the evening itself is nearly as much used up as the audience.

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THEN THE VISITING scientist closes the discussion, and tries to make those local men sorry they said so much, and sometimes he succeeds so well that the local men telephone to the secretary for the stenographer's report, and when they get it, they change it. It would be all right if they would alter these discussions with a pair of scissors, but that is not the common habit. More often the changes are made

❖ with pen and ink, a dictionary, and ten or twelve books of reference.
❖ This of course makes the discussion better, but also longer. ❖ ❖

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AFTER ALL of the ideas, big and little, have escaped into the atmosphere ❖ of the meeting room, some one with a keen sense of appropriateness ❖ remarks from the back benches, "Move we adjourn," and thirty-odd ❖ men exclaim, "Second the motion." Then the entire six hundred ❖ and eight men present vote in the affirmative. ❖ ❖

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ABOUT FIFTEEN MINUTES after the big meeting adjourns, the little ❖ meetings convene. Usually these meetings include small groups of ❖ four, six or ten men, and they hurry away from the formal atmos- ❖ phere of the room in the Academy, over to the more social air of the ❖ rathskellar or grill. Here they sit "Around the Table," and then, ❖ good friends, the paper of the evening is discussed—really discussed.

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MANY AN ESSAYIST has wended his way back home, pleased with the ❖ impression he had made, when in reality he knows nothing at all ❖ about the impression he may have left behind him. But if he could ❖ know all that had been said around the little tables by all the little ❖ men whose names never appear on programmes, and whose voices ❖ are seldom heard in the dissensions—I should say discussions—of the ❖ scientists, such knowledge would be enlightening. ❖ ❖

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AND IT WOULD be useful too. Because these scientists are really ❖ working for progress; for the best interest of their profession. Let ❖ there be no mistake about that. If besides all the pleasant things, ❖ which the leaders in the locality of the meeting might say before their ❖ faces, these writers of papers could also hear what is said by the rank ❖ and file "Around the Tables" after the meeting, they could much ❖ better comprehend the value and possible utility of their efforts. ❖

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MOREOVER, these bashful, timid men, who never open their mouths in ❖ meetings, often have mighty good ideas—ideas that would be very ❖ acceptable to the majority of dentists if they could only get into ❖ print. Do you begin to comprehend the purposes to which this de- ❖ partment is to be dedicated? ❖ ❖

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THE WRITER necessarily is present at a great many dental meetings, and ❖ quite frequently sits with those that gather around tables after- ❖ wards. For a long time he has known that hundreds of good and ❖ useful ideas are uttered at these circular sessions and never published. ❖ With the present department in view, he has been recording these ❖ practical suggestions made by practical dentists, and has on hand

❖ at the present time enough of such material to feel assured that this ❖ department can be made of interest and value for at least a year. ❖

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IN ADDITION to the notes gathered at previous meetings "Around the ❖ Table," and already filed away, we have the promise of coöperation ❖ from a number of men scattered about the country, so that the de- ❖ partment will contain the "scraps from many tables." 1914.

COMMENT. In re-reading these old papers the author is impressed by ❖ the fact that much contained in them is just as new, or rather just ❖ as useful, as when published. The general reader of today is a ❖ curious creature. Any circulating library manager will tell you that ❖ the majority of his customers ask for something "new," not some- ❖ thing "good." Because of this habit many who read through this ❖ book will find much that is "new," new to them at all events. To ❖ sustain this fact the compilation will exclude much that may have ❖ been of interest when first printed, but which has now no permanent ❖ value. The date of original publication will occur in connection ❖ with each Table Talk, that the reader may discern the "newness" and ❖ "oldness" of what it may contain. Then, where it seems pertinent ❖ a final comment will correlate the material with present views. ❖

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IT IS WORTHY of passing thought that these Table Talks, originated ❖ to meet a demand for short articles, and to supply a medium for ❖ "a compact expression of important facts," are now to be published ❖ in book form, because so many have asked for such a volume. Per- ❖ haps the deciding letter was one from a Club Member asking for a ❖ "Topical Index to the Table Talks, Around the Table." Hence ❖ this book, and the Topical Index that will render it easy for a reader ❖ to find what the Club has had to say on any topic. 1928.

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II.

DR. J. H. CALLAHAN, of Cincinnati, read a paper this winter before the First District Dental Society of New York. I do not know why I said Callahan, of Cincinnati, except, perhaps, that I thought I ought to compliment Cincinnati; because it is not necessary to identify Callahan by mentioning the village where he works. Everybody that knows anybody knows Callahan. If I were writing in Europe, I would call him "Callahan of the United States," just so that Europe would not get any credit.

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DR. GILLET, the president, introduced him as "Sulphuric Acid Callahan," but I guess that hereafter we will remember him more on account of his recommendation of "Rosin" for filling root canals. But stop a minute. There I am misrepresenting Callahan right at the start. He particularly explained that he does not use the rosin to fill the root canals, but only as an "adjuvant" when filling canals with gutta-percha. I like that word "adjuvant," don't you? Really I do not know whether I feel more grateful to Callahan for telling us about his use of rosin, or for introducing me to that word "adjuvant."

✣ ✣ ✣

AFTER THE MAIN MEETING, a choice crowd of the lesser lights, who are nevertheless noted for their luminous ideas, even though they are tongue-tied in the regular session, flocked over to the Manhattan Grill, and completely surrounded a round table constructed to fit ten. As soon as the lemonades, vichy-and-milk, cold-tea-with-lemon, and roast crackers with cheese had been ordered, about five men started to speak at once, but the Brother who is usually most mute in meeting, talked louder and more persistently, and more continuously than the other four, until one by one they gave up the contest, and all the rest of us finally gathered from the fog of words this sentence: "What does that word adjuvant mean anyway, and whatever it does mean why does Callahan use it for filling roots?"

✣ ✣ ✣

RIGHT AWAY eight out of the other nine (present company being, as usual, excepted) began to explain the meaning of "adjuvant;" but little by little our Best Root Canal Fellow, I mean Filler, got the floor and held it against all comers. Said he: "It amused me to

❖ hear Gillet call Callahan, 'sulphuric acid' Callahan, because I hap-
❖ pen to know that Callahan scarcely ever uses sulphuric acid for
❖ cleansing root canals; he uses sodium and potassium, just as all skil-
❖ ful men do. Now in regard to this new proposition of his to fill
❖ the canal first with rosin——" ❖ ❖

✣ ✣ ✣

"HE DOES NOT FILL the canals with rosin" interrupted the Mute Man,
❖ "he floods the canal with a rosin solution, and he called that an ad-
❖ juvant. I asked what an adjuvant means, and I thought you were
❖ going to tell us; instead of which you begin talking about sulphuric
❖ acid. Now if you know what an adjuvant is, please tell us, because
❖ if it is a good thing I want to order a gross right away." ❖ ❖

✣ ✣ ✣

THEN REPLIED the Canal Worker, with a smile of tolerance for his
❖ interlocutor: "Why everybody knows what adjuvants are and they
❖ don't come by the gross either." I presume he really did know, or
❖ he would not have said so, but I observed that he did not enlighten
❖ the others. It will be noted that about two paragraphs back, it was
❖ stated that "present company," meaning, of course, the "present
❖ writer," was also mum about explaining the meaning of this word.
❖ As they say about Postum, "there was a reason." Never having
❖ actually used the word himself he felt that he could scarcely claim
❖ to have a speaking acquaintance with it, but he happens to own a
❖ perfectly good Standard Dictionary, and he looked up that word
❖ "adjuvant" before he went to bed. And therein he found a very
❖ excellent definition. ❖ ❖

✣ ✣ ✣

"AN ADJUVANT," says the Standard Dictionary, is, "Any substance
❖ designed to assist the principal means." Please read that twice, or
❖ as many times as you find necessary to fix it firmly in your mind.
❖ It may seem to you, Dear Reader ("pardon the familiarity, but this
❖ appellation is permitted to editors by time honored custom"), that
❖ I have wasted a great deal of space over this word "adjuvant" and
❖ that I ought to get down to the milk in the cocoa-nut. But you are
❖ wrong; I have wasted no words, and this "adjuvant" idea is the milk
❖ in the cocoa-nut. It is not Callahan's purpose to ask us to fill root
❖ canals with rosin, but to use a rosin solution as an adjuvant; as "a
❖ substance designed to assist the principal means," the principal means
❖ of filling the canal being the old reliable gutta-percha cone. There-
❖ fore it is not a waste of time to so explain Callahan's newest proposi-
❖ tion, that no one will misunderstand it, as was the case with his
❖ sulphuric acid method. ❖ ❖

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WHILE WAITING for our milk-toast and apollinaris, it may be as well
❖ to really explain Callahan's new canal filling proposition that you

may intelligently comprehend the further discussion which occurred Around the Table. Callahan recommends a solution of twelve grains of rosin in three ounces of chloroform to be used as the adjuvant. He says that the best rosin for the purpose is that made for violinists, and purchasable at leading music stores. The formula makes a thin solution. A thicker solution will not penetrate the tubuli, but this solution will do so, when used correctly, at the same time acting as a solvent for the gutta-percha cone.

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CALLAHAN'S METHOD is to thoroughly cleanse and then thoroughly dry out the canal, flood the same with the rosin solution, and then introduce a gutta-percha cone, moving the same in and out with a pumping motion. He says: "The pumping motion forces the rosin into every opening, and at the same time dissolves the periphery, or outside of the gutta-percha cone, which becomes more attenuated, slips farther and farther towards the apex, surrounding itself with a mixture of gutta-percha and rosin, which sticks tightly to the canal walls and makes the gutta-percha more stable and proof against the action of body fluids, or substances with which it may come in contact."

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CALLAHAN SHOWED numerous actual specimens, as well as beautiful lantern slides of the same, in color, made with the Lumaire Color Process plates, that were most convincing evidence of his statement that the resinous solution penetrates the tubuli. He admixed stains with the chloroform-rosin solution, and sections of the filled teeth showed the stain radiating in all directions into the dentinal tubuli, and of equal importance, penetrating into minute tributaries from the main pulp canal. Indeed, in several cases tiny canals of this character became evident under this process of filling that would scarcely be expected to exist by those who have never made sections of teeth and who, therefore, believe that a root canal is always a single continuous channel, from pulp chamber to foramen.

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NOW THAT YOU KNOW what they were discussing we can hark back to the Table Talk. "As I was saying," resumed our Leading Canal Worker, "Callahan's sulphuric acid proposition has never been entirely understood by the majority of dentists. Anyway, the main point, as Callahan truly said, is to first get the canals cleaned out, and whether it is done with sulphuric acid, or with sodium and potassium, it then remains to thoroughly seal the foramen. One reason why I like the sodium and potassium treatment is that it not only enables us to remove the contents of the canal, but at the same time it acts as a germicide and sterilizes the tubuli. After that,

❖ if it really be true that the rosin solution hermetically seals the fora-
❖ men and the tubuli, why then I think Callahan has brought us a
❖ good method." ❖ ❖

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"THAT IS TRUE ENOUGH," said the usually silent gentleman, "but
❖ if I understood Callahan's adjuvant solution, it acts as a solvent of
❖ the cone, is thin enough to penetrate the tubuli, and by doing so
❖ deposits a resin. Now as a matter of fact do we not accomplish the
❖ same thing when we flood a canal with eucalyptus? That is a gutta-
❖ percha solvent, and probably holds a resin in suspension also, which
❖ may be deposited in the tubuli." ❖ ❖

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"LET ME CORRECT YOU," interjected the Chemist Person. Eucalyptol
❖ is a camphor, not a resin. Camphor is a crystalline substance dis-
❖ tilled from the bark of the camphor trees. It is a sedative and
❖ antispasmodic, but I cannot see how it would be useful in the tubuli,
❖ except, perhaps, that it is not soluble in water. Now, resin is made
❖ by distilling with alcohol and then precipitating with water. It is
❖ an oxidized terpene. There are three kinds of resins, the true resin,
❖ gum resins, and oleo resins. The true resins are hard compact
❖ products of oxidation made up chiefly of what are called "resin
❖ acids," which admixed with fatty acids, are capable of saponifying
❖ with alkalies——" ❖ ❖

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"WAIT A MOMENT," cried the Old Practitioner, "spare us a chemical
❖ lecture. Keep it for your class. I can't see what difference it makes
❖ whether you fill the dentinal tubes with a camphor, or a resin, since
❖ both are insoluble in body fluids. Don't forget that they saved the
❖ obelisk in Central Park from destruction by filling the pores of the
❖ soft stone with paraffin. And also remember that quite a number
❖ are recommending paraffin as a root canal filling. And by the way,
❖ let me tell you a story that will be new to you youngsters. Many
❖ years ago we had in the Odontological Society a man who would
❖ always claim that 'five years ago' he had done any new operation
❖ that might be described at a meeting." "His descendants are with
❖ us yet," said the Irreverent One, "but don't let me interrupt the
❖ story." "Well," continued the Ancient of Ancients, "one night a
❖ few of us were in the Grill of the old New York Hotel, and we
❖ plotted to try a little trick on this Constant Claimant. At the next
❖ meeting, one of our number arose and seriously described his success
❖ with common tar, as a root canal filling. Immediately our versatile
❖ member stood forth and he spoke his little piece, somewhat in this
❖ fashion: ❖ ❖

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" 'I AM VERY GLAD that our young friend has reported his experiences with tar, for though I have been using it myself for some six or seven years with marked satisfaction, I have hesitated to report it for fear it might be looked upon as too empirical a practice. And yet, why not use tar? Is it not common custom in the South to use tar on the bottoms of boats to make them water tight, and is it not moisture above all things else that we endeavor to keep out of root canals? My method is to roll the tar into fine cones, which I keep in a cool place, to render them hard, and thus easily forced into the canals. Then with a blast of warm air, the mass is slightly softened, and a second cone is forced into the first, and Gentlemen, it is my belief that not only is the foramen sealed, but the tubuli of the dentin also.'

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"THIS WAS TWENTY YEARS AGO," continued the Old Practitioner, "and it was looked upon as a joke at that time, as no one believed that roots had ever been filled with tar, save in the imagination of the speaker. Yet tonight Callahan has described, in a serious and scientific manner, a very similar procedure, for after all does not tar come within the resin group?"

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"THAT DEPENDS," exclaimed the Chemical Expert, "upon whether you are alluding to coal-tar or wood-tar. The former is obtained in the manufacture of coal-gas, and is otherwise known as gas-tar. Wood-tar is made by a distillation of pine, or other resinous woods. The conversation has taken a curious turn, and really it might be of advantage to experiment with tar as a root canal filling. Tar is not only a resinous product, but it likewise contains paraffin. Also it yields valuable disinfecting compounds, such as carbolic acid, and cresol. Moreover, it is a reliable preservative agent. Again——"

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"NO! NO! NOT AGAIN, nor yet ever," cried the Sleepiest Man; "Somebody pay the check and let us go home. You have all been talking about filling roots as though a root canal could be made about the size of a gas pipe. When I get them that size, I can fill them myself, not only to the end, but often a long way beyond the end. And I can fill them with anything from soft soap to silver wire. But when you meet those nice long fine canals, so fine that it takes about an hour's work to get the finest broach approximately near the apex, and only about a tenth of a second to withdraw one-half of the broach and leave the other half permanently lodged about a millimeter this side of the foramen, that is the time when I feel like calling in one of you canal experts to teach me how to fill roots. And some night I am going to ask somebody exactly that

❖ question, but not tonight. It is too late. Here, Waiter, give me
❖ that check. I want to be popular the next time we gather Around
❖ the Table because I am going to be fussy and ask questions. Ta!
❖ Ta! Boys!" 1914.

卐————卐

COMMENT. The above Table Talk is of interest because it records the
❖ first impressions made by Dr. Callahan, when he presented his
❖ method of using rosin. The formula is incorrectly recorded here,
❖ but appears properly transcribed in a later Table Talk. Note that
❖ one gentleman, speaking of sodium and potassium, definitely and
❖ dogmatically stated that it not only removes the contents of the
❖ canal, but also "acts as a germicide and sterilizes the tubuli." Yet
❖ despite this dogmatism, our research workers at this very time are
❖ seeking a substance that will do just that—sterilize tubuli. ❖ ❖

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WHAT WE NEEDED in those days, and what we need even in these
❖ days, is less dogma and more proof. ❖ ❖

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ANOTHER MEMBER made a statement which is just as apt now as it
❖ was then. Too many describe root canal technique as though canals
❖ can be made the "size of a gas pipe." This criticism of the text-
❖ books and of the teachers is still trite. Only today it is even worse.
❖ For years we were taught that it was advisable to fill a canal with
❖ gutta-percha until the root filling could be discerned in a radiograph,
❖ extending somewhat into that mythical area the "apical space." I
❖ say mythical, not meaning that there never is an apical space. But
❖ there never is any physiological space. A space at the apex of a
❖ root is always pathological. Now if sterile gutta-percha is pro-
❖ truded into a pathological, and hence probably infected "space,"
❖ how long will that gutta-percha remain sterile? Who knows?
❖ However that was called "encapsulation." ❖ ❖

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ENCAPSULATION WAS A FASCINATING style of filling, and Lord,
❖ how stylish our root canal fellows did become for a while.
❖ Thousands of lantern slides showed pictures of roots with bulbous
❖ extrusions of gutta-percha at their terminals. You see, it really
❖ was much easier to force the gutta-percha through the apex, than
❖ to prevent it from passing into that realm from which no gutta-
❖ percha ever returns. ❖ ❖

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BUT STYLES CHANGE, in root canal work as elsewhere. Girls
❖ fifteen years ago were carefull about lifting their skirts for fear of
❖ showing their stockings. The girls of today appear to be mostly

clad in stockings. The popularity of encapsulation has largely passed. Today it is declared that the root canal filling may reach the exact end of the root, but must not go farther. But who tells us how to do this? Oh! I know! We have been told, but the trouble is that the method looks better on paper than it does when put into practice. Sometimes it succeeds. Oh! Yes! And that accounts for the pretty lantern slides. But then again——

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PERHAPS THE LATEST SCHOOL is the one that declares that our root fillings must reach to, and stop at, the "dento-cemental junction." But who has told us how to locate that locality? If it were only a rail-road junction now, one might buy a ticket and get out when the junction were reached. But there are no trains passing through root canals, except the train of symptoms. 1928.

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III.

I HAD EXPECTED to meet a few choice spirits in the Grill of the Hotel Biltmore, New York's new five-million-dollar inn, but none was there. Oh, yes! There were choice spirits there in plenty, but I was not thinking of that kind. But now that you mention that kind of spirits, that hotel is so close to the Grand Central Station that they could appropriately hang out a sign reading: "First Chance." That would be a novelty in New York, though common enough in Texas.

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RETURNING TO OUR MUTTON (it was lamb that I ordered, but mutton that was served), when I found the place deserted of my kind, I was tempted to abandon the millionaire atmosphere and go over to a Child's Restaurant. No! I do not mean a children's restaurant, but a Child's restaurant, just as I wrote it, though if I followed the current fashion here in New York, where everything edible, and much that is not, is **á la Francaise**, I should say **Un Café des Enfants.**

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HOWEVER, HAVING ordered my chop, I kept my seat and nursed my grouch. A man is so likely to feel that way when dining alone; he is in such bad company. You are wondering what all this has to do with teeth! Well, let me assure you there is no place where one is more apt to think about teeth than in an eating room, especially when one orders a chop. Did you ever think backward? Don't know what I mean? Let me explain. A thought comes into your mind and you ponder over it; but did you ever analyze the thought, seeking to trace the sequence of preceding thoughts, which had, as it were, brought the last thought into existence. Try it sometimes. You will find it entertaining.

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I HAD HARDLY bitten into that lamb (mutton) chop when I thought of rubber; in fact, of rubber dam. I had a little lady from Boston once, a young miss of some —— summers; they never say just how many in Boston; they "keep their own statistics." But this little Boston girl somewhat abashed me by asking: "Do you use elastic profanity?" For a moment I did not know whether to say "Yes," or "No," so I said "Sometimes."

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SINCE THEN it has often occurred to me that the rubber dam can be used in such a way that it would require very elastic profanity if the patient were to express his (or even her) thoughts, and keep nothing back. To revert to my own thoughts; "Why was it that I thought of rubber?" I admit that the lamb was mutton, but it was not tough. Tracing backward I analyzed it thusly: In the first place, the men who had promised to dine with me were dentists. Ordinary courtesy compels me to concede that much. But thinking of them as dentists, led me to think of the sort of dentistry that they do; and from that I thought of the sort of work that they do not do, but which they ought to do; and it then occurred to me that when they do not do the sort of work that they ought to do, that they "do" their patients. That, of course, is slang, and I never use slang when I am writing, nor when I am speaking. But this time I was thinking, and one cannot always edit one's thoughts.

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ARRIVING THUS at the point where I was forced to admit that my dentist friends are unjust to their patients when not doing thorough work, I grasped the important corollary, that they also are unjust to themselves. Because, as a wiser man than I has said, "Practice makes perfect," or I might add with particular application to our specialty: "Practice makes perfect work more easy, and thus produces a more perfect practice." Just you digest that, and if your mental metabolism is not faulty you should obtain considerable nutriment out of it.

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THEN CAME another thought. A great many dentists do, or do not do, certain things, on the ground that they are considering the comfort of their patients, whereas, if the truth were known, the real actuating impulse is their own convenience. For example, the man who fills his patients' front teeth with white gutta-percha, at five dollars the first year, six dollars the second year, seven dollars the third year, and so on, as the cavities increase annually in size, tells you that he is practicing painless dentistry. But I tell you that he is practicing profitable dentistry, and the patient gets very little of the profit.

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BESIDES THE GUTTA-PERCHA man, there is the dentist who never uses the engine; and the fellow who caps a pulp because it is so painful to "kill the nerve"; and who mummifies the "dead nerves, because Nature can fill a root canal so much better" than he can. Which, by the way, is true. And the fellow who —— Just here the waiter brought me my meal. I cut off a bit of the chop, put it into

❖ my mouth, and thought of rubber. But, you see, the chop really
❖ had nothing to do with the rubber idea, I being at the Biltmore,
❖ and all that. ❖ ❖

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THE FACT IS my sequence of thought, and the absence of a particular
❖ one of my friends, made me think of those fellows who boast that
❖ they never use the rubber dam. "The patients hate it so!" Wow!
❖ Yet a large number of these non-rubber-dam-dentists (leave out
❖ the first two components of this compound word if you like, and
❖ get even closer to my idea); a large number, I say, have beautiful
❖ electric, nickle-plated sterilizers, on nice white-enamel stands. And
❖ a girl all in white, to bring the sterilized instruments, in a white
❖ porcelain-lined tray, over to the clean glass dental bracket, where
❖ the dentist himself in white linen pyjamas, with hands all freshly
❖ scrubbed with boiling water and ethereal germicidal soap and dried
❖ on a use-and-throw-away-paper-towel, proceeds to undertake a per-
❖ fectly aseptic operation. And none of this is kept secret from the
❖ patient, either; because the sterilizer is right over there by the front
❖ window, where the light is good; and the girl in white is a live one,
❖ and good to look at; and the dentist himself explains that the worst
❖ bacteria of them all propagates every twenty minutes, and, conse-
❖ quently, the only safe way is to boil the instruments every twenty
❖ minutes. Because, don't you see, this keeps the sum total of the
❖ bacterial population of that office down to one. And that one poor
❖ old Streptococcus has been around the place so long that he is per-
❖ fectly tame, and warranted not to bite. And there you are! What
❖ more could you ask for in the way of asepsis? ❖ ❖

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AND THEN that perfectly sterile dentist (en passant, as our French
❖ friends say, a sterile dentist is a dentist who is barren of real logical
❖ thought); well, whatever he is, he proceeds to operate with all those
❖ perfectly clean instruments, and with those perfectly clean hands,
❖ in a mouth so filled with bacteria, that if they were only visible,
❖ they would make the place look like a public ball room with
❖ Streptococci, Pneumococci, Bacillæ, Spirrilli, Micrococci, Spiro-
❖ chætæ and their friends doing tangos and turkey trots all over the
❖ gums, tongue and teeth. And he does this without isolating the
❖ field of his operation from all these dangers with the rubber dam.
❖ And he boasts of it! And he eschews the rubber dam in the in-
❖ terests of his patients! And he calls himself a dental surgeon!
❖ Surgeon, mind you! ❖ ❖

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"OH, DAMN!" Like a minister of the Gospel who was recently sum-
❖ moned before his Church Committee because he remarked, "There

❖ are things a damned sight worse than dancing"—let me interject
❖ the information that when I say "Oh, Damn!" and when I repeat
❖ "Oh, Damn!" I do so in a purely biblical sense, and with the hope
❖ of planting a seed in the minds of the younger generation of den-
❖ tists, that may produce a harvest worth garnering. ❖ ❖

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GRIEVES, HARTZELL, RHEIN and others have taught us the dangers
❖ of infecting the entire system, by permitting infection to remain
❖ at the apices of tooth roots. How much more reprehensible, then,
❖ must it be for a dentist to actually cause such a condition! In view
❖ of the awakening of the medical profession to this danger which
❖ their patients meet at the hands of dentists, the dentists must be
❖ aroused to the gravity of the situation, and the fundamental and
❖ primary dogma should be that root canal work must be done with
❖ every safeguard against either infection or reinfection. It is, there-
❖ fore, obligatory that the tooth upon which the operation is to be
❖ performed should be isolated from its surrounding septic environ-
❖ ment. And this can only be done with the rubber dam. ❖ ❖

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"THIS IS IMPOSSIBLE sometimes," you say. Or, if you do not say it,
❖ you think it. Anyway, one of my friends said it, and that is why I
❖ asked him and a few others like him, to meet that night at the
❖ Biltmore Grill. I wanted to talk this over with them "Around the
❖ Table." I wanted them to have a chance to answer back, because I
❖ had intended to tell them how to do it. But they did not arrive.
❖ Even so, why should I not tell how to use the rubber dam, where
❖ it seems impossible to use it? I can send them marked copies of
❖ this issue of Items of Interest, and perhaps when I next ask them
❖ to dine wtih me, they will come, and tell me how to do something.
❖ You see, I am a great believer in reciprocity. ❖ ❖

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I SAID A WHILE BACK that practice makes perfect. I have been
❖ using the rubber dam, wherever possible, during all the years of
❖ my practice, with the result that year by year the impossible cases
❖ are fewer and fewer in number. Just at the moment the only con-
❖ dition which occurs to me, in which I could not apply the dam, is
❖ where an erupting tooth is carious, though only partly erupted. In
❖ such cases it is not common to find root canal treatment needed and
❖ temporary fillings can be inserted until eruption be completed, when
❖ the dam may be used and permanent work introduced. ❖ ❖

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LET US THEN consider a few of the most difficult cases; conditions in
❖ which, for the sake of sterilization, the dam seems obligatory, and

yet where it seems almost impossible to apply it. I cannot do better than to relate the first case in which the solution of this problem occurred to me.

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BUT BEFORE I DO THAT let me give notice. It matters nothing to me if some of you readers have done this "twenty years ago." And I am not telling this to claim any credit for solving the problem. If a lot of you have done it before, I do not recall having seen it in print, and it is worth printing. And even if it has been in print, it is worth printing again. Perhaps others, like myself, have never heard of nor seen the method before. So understand, I do not claim that this will be new to all of you, but I do think it will be new and useful to a number of you; and what is of vastly more importance, to a great many patients.

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A PATIENT some time ago applied to me with his mouth in a most unhygienic condition, and suffering pain in a right lower third molar. The first and second molars had been extracted. The third molar wore a crown, though it was no kingly headgear. A radiograph disclosed unfilled root canals, and two "blind" abscesses. Removal of the crown exposed the fact that a distal cavity, extending well below the gum margin, had been crammed (not filled) with gutta-percha. Removal of all cement and gutta-percha left the root with very little of the wall standing above the gum margin. The roots were long, and solidly fixed in the jaw, and if health could be restored would serve well for a bridge abutment. But the mouth was exceedingly wet, tongue active, and patient restless.

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THE EXTREME NECESSITIES of the case suggested the remedy. A German silver band was fitted around the root with an extension distally which passed sufficiently below the gum margin to engage the margin of the root cavity. With cement rather stiff to hasten setting, this band was cemented to place, and held firmly in position till the cement had set. Enough cement was removed from within the band to permit access to the root canals, and with a dressing in place, covered with gutta-percha, the patient was dismissed. At the next sitting the cement had sufficiently hardened to permit the utilization of a clamp and the rubber dam. The three root canals were fully explored, the abscesses finally cured, and the canals filled, all of which was demonstrated by radiographs.

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ANOTHER ADVANTAGE of this method was that after filling the root canals the cement was removed from within the band, to clearly expose all margins of the root circumference, and without

displacing the band, it was made to serve as a matrix, and amalgam was packed and anchored so as to build up the root properly for the reception of the final gold band. Moreover, as summer was approaching the patient was dismissed with the band still in place, and it served as a temporary crown for four months, by which time all disease had been exterminated. Thus was this almost hopeless condition treated, and a healthy, firm abutment for bridgework saved for the patient.

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SUBSEQUENTLY a variation of this proceedure was thought of. A patient presented with a well-fitting gold crown on a lower first molar. This had been made by one of that class of dentists already described, who just hates to hurt a patient. He, therefore, had placed this crown over a living pulp, which had died, causing an abscess. This crown was removed without slitting the band. A hole was drilled in the side near the cusps of the crown, which hole was enlarged sufficiently to receive the end of a stout instrument, which, used as a lever, readily pried off the crown, thus preserving the band intact. This band was thoroughly cleansed, the cusp portion cut away, the edges made smooth, and then, after cleansing all old cement from the tooth root, this band was cemented to place, and utilized for simplifying the application of the dam, as in the last case.

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THESE TWO EXPERIENCES have established another and more frequently useful technique in my practice. Very often we have root canal work to undertake in teeth, where an approximal cavity has burrowed below the gum margin to such an extent, and the mouth is so moist, that it seems next to impossible to exclude the mouth fluids with the dam. And yet we know that an absolutely dry field is necessary to aseptic operation. In such cases I wedge the teeth apart on the unaffected side of the tooth, to obtain ready access for the fitting of a band. Then with the thinnest of platinoid, which I now prefer to German silver, I make a soldered band which passes below the gum and engages the cavity margin at the carious aspect. This band should be nicely burnished to the walls of the tooth, and when cemented to place should be further stoned and polished so as to be acceptable to the tongue, because occasionally treatment may cover a prolonged period.

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THIS METHOD not only permits a perfectly aseptic root operation, but, if the band be well made and fitted, the gum septum between the teeth will recover much more rapidly than where gutta-percha is packed against it continually, as in the usual methods. More-

over, when the time for filling arrives, and the band is removed, the gum at the cervix will stand away sufficiently so that a perfect wax pattern for an inlay can be obtained, in which the imprint of the cervical margin will be sharply distinct. 1914.

COMMENT. The above letter is printed without change, except that in one place I speak of the "dangers of infecting the entire system, by permitting infection to remain at the apices of tooth roots." In the original instead of "infection" the word "abscesses" was used. I note also that I used the word "abscesses" in two other places. These I have permitted to stand because I cannot recall whether there were abscesses present or not. In this day we would be more cautious; we would not use the words abscess, granuloma, and infection, interchangeably. Yet the medical men call every dark spot in a radiograph an abscess. Heigho!

IN DESCRIBING THE TECHNIQUE for banding teeth in order to render the use of the rubber dam possible, I mention that in my first case I used "German silver," and later I state that I had abandoned this for "platinoid."

AT THE PRESENT TIME I find it more convenient to utilize the seamless copper bands that can be purchased in a variety of sizes. This facilitates a special technique when caries has extended far below the gum margin along an approximal surface. A copper band, of proper size to be forced over the tooth and burnished down, is accurately fitted to the tooth just to, but not below the gum margin. A second band of exactly the same size is then selected, and cut in half. From one half of this band, a lip, or extension is cut to the proper shape to extend below the gum margin and engage the cavity margin. Then the upper edge of this lip or extension is placed within the fitted band, along the approximal surface, and the two are readily united with soft solder. Further shaping and fitting of the band with its extension, the extreme edges of which latter should be bent toothward as described, will finally afford us with an accurately adjusted band which will not annoy nor irritate the gum. Indeed, after the treatment of the tooth, the rest will have afforded the gum time to heal. 1928.

IV.

DR. W. L. WHIPPLE, of St. Louis, Missouri, writes as follows: "Sorry I could not dine with you that night at the Biltmore. But let me warn you that the method of removing gold crowns, as mentioned in the March issue, and as advocated by Dr. Ottolengui some years ago, is not always a success. I allude to the method of drilling a hole just beneath the cusp surface of a shell crown, and then using a long instrument as a lever to pry it off. Twice within the past year, wishing to remove a gold crown with as little injury as possible, this lever method was adopted, with the result of fracturing the natural tooth, probably due to the adhesion of the cement, since, the fractured fragment came away with the crown. As we are unable to know the condition of the crowned teeth, I have arrived at the conclusion that the method is dangerous.

"I MAKE IT A RULE to apply the dam when treating roots, yet there are many cavities in upper teeth which may be so isolated and sterilized as to be absolutely safe to fill without the dam.

"I KNOW THAT YOU FELLOWS in New York are radical about filling every root before applying a gold crown, but I stand with Dr. C. N. Johnson, and do not believe it always necessary. Within a month I removed a six-tooth bridge from its attachment to a third molar, which the patient stated he had worn thirty years (having been once removed and repaired), and found the pulp still vital. Many similar cases have come under my observation, though of shorter duration."

DR. WHIPPLE, for example, has not said the last word by any means. On the contrary he has started something, and I thank him for it. First though, he says that it is not always safe to drill a hole in a shell crown and use a long-handled instrument as a lever to pry it off. He says you might fracture the natural tooth. In fact, he knows that, because he has done it twice. That is what we want—the facts. Personally, I have never met such an accident, but as Dr. Whipple has, it must be possible, consequently we should be cautious.

NEXT HE SAYS THAT some teeth in the upper jaw may sometimes be treated without the rubber dam. Oh, very well. So long as you do sterilize the root, and fill it aseptically, it matters little whether you use the rubber dam, or some other dam way. (Notice to printer, no "n" in dam.) And I think it matters little to the patient either. I have been the patient, and know whereof I speak. I have had an upper tooth dammed up with two huge aseptic cotton rolls (sign of a Red Cross on the box), and a more or less comfortable clamp—principally less. And for my part I would have been just as happy, the tooth just as dry, and the rest of my mouth not so dry, but more comfortable, if the rubber dam had been used.

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BUT I SAID that Dr. Whipple had started something. He started it when he said that the fellows in New York are radical. By the way I am not sure of that. A few are Bull Moose, but the majority here in Manhattan are Democrats. Dr. Whipple says the New York fellows are radical because they fill all roots before they attach the bright and shining golden crowns. Honest, that is the nicest thing that has been said about the New York boys for a long time. Then he tells us that he stands with Dr. C. N. Johnson, and that in his opinion, it is not always necessary to remove a pulp before placing a shell gold crown. Then he relates a real nice story about a bridge that rested one of its ends on a third molar for thirty years (which is ten years longer than the regular claimant usually claims for a good old-fashioned dental operation), and that the wise old wisdom tooth still lived to see the bridge swept away.

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CERTAINLY I AM not going to deny that a molar tooth may carry a crown for years and years and years, and still harbor a vital pulp. It is easy enough to make this discovery when the crown at last is removed. All one need do is to drill into the tooth, and if the pulp bleeds it probably was alive prior to the experimental puncture. But the difficulty is to know at the time when one is putting the bridge on, in the first place, whether or not the particular pulp about to be hidden under a bushel of gold will live or die! Whether it will live happily if it does live, or whether it will live unhappily and grumble for years. Because my Thoughtful Diners, don't forget that a thing may be very vital and yet very diseased. Once upon a time, I tested this matter. I removed a number of shell gold crowns, which had been placed on living teeth, and I found—

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MEANWHILE I have been to the great Illinois meeting. Naturally, I met Callahan. We were discussing him in New York, you remember, last February. He took me over to the Blackstone Grill. He

would have fed me at the "La Salle," only it was so crowded with dentists (5,000 wore badges), that it was not possible to have any private converse anywhere. And Callahan had a special secret to impart. This is it: "My dear boy," said Callahan. (He calls me his "dear boy" so that I will understand my own insignificance, and because, being a pseudo-Southerner, he thinks youth must respect age.) "My dear boy," said he. "You made a blunder in regard to that rosin preparation of mine. You printed it, 'Rosin twelve grains, Chloroform three ounces,' whereas it should have read, 'Rosin twelve grains, and Chloroform three fluid-drams.'" Well, of course he had the best of it. He knows the proportions better than I do, and as he made me return the original manuscript from which I copied it, I could not prove that it was his mistake, or his typewriter girl's mistake. But naturally I had to say something, so I said: "Don't let that trouble you, Callahan. If the fellows put up the prescription as we printed it, just on a sudden impulse to buy something, even though they do have three ounces of chloroform to start with, by the time they use it the proportions will be about correct, because the chloroform evaporates and the rosin does not. Also, because it takes most men some time to abandon their own method to try another man's."

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CALLAHAN GASPED, by the time he grasped that, but before he recovered I had another little dagger for him. "By the way, Callahan," said I, "at the First District Meeting in New York, you showed us a fine set of specimens where you had filled the roots of teeth and then ground them down to the canals for exaamination. You told us you had used methylene blue with your rosin solution in order to determine whether or not the rosin solution had really penetrated the tubuli. Your specimens showed the blue stain extending in some places as far as the cementum. Dr. Nies of Brooklyn thinks you may be deceived, and that possibly your stain has penetrated farther than the rosin."

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DR. NIES writes as follows: "What I sought to prove is that while methylene blue will follow the free and combined watery moisture of the tooth and stain it; a rosin solution will not do so. Specimen No. 1 illustrates this. (A tooth filled with rosin solution, followed by a gutta-percha cone. The stain has not passed beyond the canal walls.) No. 2 shows how methylene blue spreads when put in free, a point of gutta-percha being put in on the following day. (This specimen shows the stain penetrating quite to the cementum in places.) I do not wish to be understood as saying that methylene blue can spread through dentin only in a watery solution.

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"I KNOW THAT carbolic acid does the same thing, for the following reason: I had a delicate patient who collapsed every time that I used cocain, or painted her gum with aconite and iodin. This solution could not have carried more than a drop of aconite per application. Efforts to offset the action of these drugs with strychnine, used as an antidotal remedy, failed, so I tried forcing carbolic acid into the dentin with pressure, and was rewarded with an anesthesia that compared favorably with any cocain solution I have ever used. I easily removed the pulp without discomfort to the patient. Later, to prove that the carbolic really passed through the dentin, I colored it with methylene blue, and with pressure forced it towards the pulp. After pressure for ten minutes I entered the pulp chamber and removed a blue pulp. This work was done on a molar, which I was about to crown."

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BUT WE MUST NOT forget that Callahan is sipping his soda-water in the Blackstone Grill, and waiting for a chance to answer Dr. Nies. Here is Callahan's side of it. Said Callahan: "Dr. Nies spoke to me in New York about the tendency of the blue stain to out-travel its vehicle. He may be right, but he was using an aqueous solution under pressure, that pressure driving blood out of the blood vessels in the pulp tissues, and replacing the blood in part with the blue stain. The rosin solution is pushed into more or less empty tubules, the tubules supposed to be dry, and furthermore, the vehicle carrying the blue (chloroform) is not a hydroscopic agent, and does not give up the stain in the presence of water. Witness, the stained teeth were ground on wet stones and since grinding have been washed many times.

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"I TRIED MANY STAINS and had just that trouble. For example—eosin. When the tooth, stained with eosin, is placed on a wet stone the stain will scatter all over the tooth, the whole tooth taking on the eosin color."

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"I DO NOT WISH to throw any cold water over this rosin proposition," said I to Callahan, "and I hope you prove it to be the final and best method, because if ever a problem in dentistry needed final solving, it is root canal filling. But I do wish to ask one mean question. When you fill a root canal, out of the mouth with rosin solution and gutta-percha, and then grind the root on a grindstone, does not that very grinding make the root filling seem better adapted to the canal than it might have been before the grinding? And really you know, Cal, we can not use a grindstone on the roots in the mouth to make the canal fillings fit better."

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"DON'T BE SILLY," said Callahan. So I told him I would not. It would have been silly, I suppose, to press the question.

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"WELL, THEN," said I. "Here is another argument for you. I was talking over this rosin proposition with Dr. Taggart, in New York, at the Ritz-Carlton one afternoon, while we watched the partakers at a **Thé Dansant**, and ourselves partook of a couple of cups. ('Cups' is good, eh! What?) And Taggart told me that for years he had used Venice turpentine in canals, before introducing his gutta-percha point. He declared that he had had a bottle of Venice turpentine for years, and that it practically does not alter in bulk, remaining in a semi-plastic condition, and as it has distinctly germicidal qualities, its plasticity and unchangeable characteristics in his opinion make it a useful adjuvant for root canal fillings in conjunction with gutta-percha."

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ON THIS SAME general subject, Dr. Nies tells me that "Venice turpentine is a species of rosin from an Alps pine. So is Canada balsam a rosin. This substance has been used in Germany for many years as a root canal filling. Only in a slight degree do these pine rosins present any germicidal, antiseptic, dessicant, or preservative qualities. They are only moisture proof. I sought in a synthetic combination of formaldehyd, cresol and mineral copal, an antiseptic root canal filling that might have the medicinal and physical qualities of those medicaments that had proven most successful in the hands of the profession.

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"I THINK THE MATERIALS that we use at present are not all that could be desired. We realize this when we remove a gutta-percha point that has been in for a few years. These cones are frequently loaded with as much as 50 per cent. of zinc-oxid, talc or phosphate of calcium. It is the presence of these minerals that make the root filling visible in radiographs. I find the use of pure tin, finely pulverized, mixed in my solution, better defines the outlines of the root canal."

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"ONE OF THE POINTS that attracted my attention in your February talk," said Callahan, "was the remark made by the Chemist in relation to camphor. I have tried out all the rosins, and many other substances, including amber; also camphor. Nothing so far has proven so satisfactory in my hands as the rosin. As to copal, I have some experiments with that as well as other substances under way. Canada balsam looked good for some time, then lost its attractive features. It is the time test that counts. The rosin solution has

❖ made the best record for me in four years of testing. In my opinion
❖ formaldehyd has about as much of a place in a root canal filling,
❖ as has ground glass in a dentifrice." 1914.

COMMENT. Please note that Callahan here gives us the correct formula
❖ for his chloroform rosin solution. 1928.

V.

YOU WILL RECALL a few remarks in our last Talk dealing with the subject of gold crowns over molars harboring living pulps. I was just swallowing the last bit of my strawberry shortcake at the Grill of the Hotel Ten Eyck, during the meeting of the New York State Dental Society at Albany last month, when my good friend Tompkins, Tompkins of Utica, loomed in the offing. Pardon the sailor-like language, but I have been reading how the Resolute beat the Vanité, and that the Defiance still has a chance, etc., etc., and my mind is just a little yachty. What is that? No, I said yachty. I never use slang. But we left Tompkins in the offing.

"COME WITH ME," said friend Tompkins, in a voice that sounded like the command of a secret agent of the Camorra, whatever that is. But, having fed well, I took my courage in hand, and went with him. He led me toward the Education Building, where the meetings were held, and partly, I suppose, to aid in my education, as soon as he had me in the shadow of the great structure he continued in his most impressive manner: "A molar which is to have a shell crown attached needs to have its pulp removed just as much as an elephant needs a spring overcoat!"

THE PICTURE of an elephant in a spring overcoat rather awed me. Really, I could not imagine why an elephant would require an overcoat of any kind, considering the toughness of his regular coat. So I thought it best not to interrupt, but just to listen. Friend Tompkins gave me a few minutes to digest that Elephant and Overcoat, and then added: "I suppose the 'pulpicides' in New York will argue that you have found a great many dead pulps under shell crowns, but I ask you, have you not found dead pulps under your large gold fillings and inlays likewise?"

TOMPKINS DID NOT give me time to telegraph the boys in New York for a reply, but went right on to answer, "You certainly have. Why, then, should you remove a pulp from a molar you are about to crown? Not because of the mere fact that it is to carry a crown.

❖ You should examine the tooth and determine whether or not the
❖ pulp should be removed, entirely aside from all question of crown-
❖ ing it. The fact is that teeth that are crowned usually are already
❖ badly carious. If not, a filling would be inserted. If carious, very
❖ often the pulp is already infected, and the man who erroneously
❖ crowns such a tooth, later finds a dead pulp, and possibly an abscess,
❖ not because of the crown that was placed, but because that pulp
❖ was destined to die in any event. We should discriminate, not jump
❖ to conclusions." ❖ ❖

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JUST SO, and if we do discriminate we must take into consideration the
❖ pulps that have died where crowns have been placed over perfectly
❖ healthy, sound teeth; teeth having no caries and presumably no pulp
❖ disturbance of any sort prior to the crowning. Yet, subsequent to
❖ placing the crown, we have patients complaining of mysterious neu-
❖ ralgic pains, even where the pulps remain alive. And sometimes
❖ we know the pulp dies, because we discover a nice little fistula right
❖ over the main abutment of our beautiful little bridge. And we
❖ just hate the sight of that fistula, because the man has just paid the
❖ last instalment on that bridge, and it annoys us, it really does annoy
❖ us to have him ask, "Doctor, what are you going to do about that
❖ gum boil?" ❖ ❖

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NOW, IS NOT THAT a mean question for a patient to ask? Do we
❖ want to tell that man that it is not a gum boil, but a regular abscess;
❖ and that a regular abscess means an abscess that discharges pus into
❖ his mouth regularly every morning before breakfast, and that he
❖ swallows it with his poached eggs? Do we want to tell him all the
❖ different diseases that Grieves, Rhein and Hartzell say he can get
❖ if that abscess is not cured? Above all, do we want to tell him
❖ that the only way to cure the abscess is to take the old bridge off,
❖ treat the tooth and make a new bridge, with a new set of instal-
❖ ments? Do we want to tell the man all these things? We do not!
❖ Then do we not wish we had taken that pulp out in the first place?
❖ We do! Well, then, there you are. ❖ ❖

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WITHOUT GOING further into the general discussion at present, I
❖ will at least reply to one of Dr. Tompkin's statements. He sug-
❖ gests the idea that pulps often die under large gold fillings and in-
❖ lays. This is quite true, and when we made large gold fillings by
❖ hammering them in, this was a most difficult problem. It often
❖ taxed the best judgment to determine whether to remove a pulp
❖ before filling or not. The long hammering itself became a factor
❖ that might cause the ultimate death of a pulp. But let me indicate

❖ to you a most useful method of dealing with such cases, now that
❖ we have the inlay process. ❖ ❖

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LET US SUPPOSE that we have a large cavity in a molar or a bicuspid,
❖ and after removal of the decay the pulp is almost exposed and the
❖ tooth very sensitive. I will not here discuss the methods by which
❖ we may determine whether it may be safe to attempt conservation
❖ of the pulp, except to say that a conservative method is demanded
❖ in proportion to the youth of the patient. At the age of twelve, to
❖ fourteen or sixteen, every risk should be taken. As the patient is
❖ older it is less excusable to take any risk. ❖ ❖

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HAVING DETERMINED to make an attempt to conserve the life of the
❖ pulp, the pattern for a cast gold inlay should be made without the
❖ interposition of any capping of any kind. The pattern having been
❖ obtained, its reverse side should be carefully studied and a cavity cut
❖ in it as large as may be made without interfering with the retention of
❖ the inlay. This hollow in the underside of the inlay pattern should
❖ be extended toward the occlusal surface until when held up to the
❖ light the wax is seen to be so thin as to easily transmit light rays.
❖ By this means we secure an inlay when cast which, at exactly the
❖ proper situation, presents a very thin layer of gold, easily punctured
❖ in case it should become necessary subsequently to drill through
❖ because of death of the pulp. ❖ ❖

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I HAVE NO DOUBT that many practitioners have followed this method,
❖ but the majority, so far as I know, then make the mistake of filling
❖ this hollow part of the inlay with cement at the time of setting. It
❖ is manifest that in case the pulp should die and the tooth become
❖ sore it will be a painful procedure to drill through his mass of
❖ cement after puncturing the gold. The better procedure is to fill
❖ this hollow part of the inlay with gutta-percha, or even soft gutta-
❖ percha, "temporary stopping." By this means the mass of gutta-
❖ percha acts as a non-conductor over the point nearest to the pulp,
❖ and in case any subsequent opening of the tooth is required, the
❖ drill easily pentrates the soft mass. ❖ ❖

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I HAVE DONE this operation a great number of times, and thus far
❖ have only once had the pulp die, probably because, being one of
❖ the New York "pulpicides," I do not take very great chances. But
❖ in one instance, in a lower first molar, I did place a very large
❖ inlay restoration over a pulp that was very doubtful in character.
❖ The tooth annoyed for some weeks, and finally became quiet so
❖ suddenly that I became suspicious. Upon investigation I diagnosed

death of the pulp. I drilled through the inlay, easily passed through the gutta-percha, and eventually removed the dead pulp, filled the canals and set a new inlay, which fitted into the old one as a cork fits a bottle. That is to say, all margins of the new inlay were in the old, no part touching tooth substance.

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IF THE ORIGINAL inlay had good margins, and, of course, it would have if you or I made it. Care should be taken when drilling through it not to cut through the original gold into contact with any margin, for the reason that this might disturb the first plan of retention. If the second inlay fits the first like a cork in a bottle, that is to say, with slightly sloping sides, when set it may be driven to place so tight that if stones are used while the cement is yet somewhat soft the eye will be unable to detect any line of demarcation between the old and the new gold. 1914.

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VI.

YES, INDEED, there were several Table Talks at Rochester. The following crisp remarks were caught by our official dictograph which we had installed at the Hotel Seneca. As no names were mentioned none can be repeated. Some folks are cautious that way. They have had their private wires tapped before. "Well," said one voice, a mellow Baritone, "it looks as though reorganization has been accomplished." "Which reminds me," replied a tender Tenor, "of an incident that occurred some years ago. There was a car strike in New York, and I was returning to my home in Brooklyn, when I started conversation with the driver. We had horse-cars then. He was telling me that the Brooklyn men would go on sympathetic strike, if the New York City railroad Barons did not soon relent, 'Because,' said he, 'eight hours is long enough for any man to work.' To which I replied, 'Oh! I don't know. I work ten hours a day myself.' 'Then you're not organized,' rejoined the driver, clucking to his horses. But as you say, we are organized now, and I wonder if that will shorten my hours any."

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OVER AT THE POWERS' HOTEL I did not require a dictograph, being personally present most of the time. I chose that place to live in because there were no politicians there. What did you say?

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THEY CERTAINLY tried to get at the root of things in Rochester. Callahan, Rhein and Gillett presented important and most entertaining talks on root canal technique, while Eisen and others explained the values of radiography. Again in the progressive clinic, Elmer Best demonstrated his method of entering, cleansing and filling root canals, all proven with radiographs.

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THE CLOSING sentences of the splendid discussion of Callahan's paper, contributed by Gillett, made a marked impression. Not having the manuscript I cannot quote verbatim, nor can I hope to repeat his thought in language as choice as his; but as best I can let me give you his message.

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GILLETT in closing his discussion said: "The radiographers have convicted the dental profession of gross incompetence in this matter of root canal filling, and the pathologists are declaring that to this faulty root work can be traced disease, chronic invalidism, and even death. And I say unto you, that even though these disasters occur long after you do your work; even though the sickness and deaths cannot be brought so directly to your doors that you may be punished for your sins; even though they may have been sins of omission; with this knowledge of consequences indicated to you as it now is, you cannot go on and remain blameless even in your own minds. Unless you perfect your technique, unless you fill root canals properly or not at all, in the future you will not dare look over your shoulders for fear of recognizing the gibbering spectres that will follow you about!"

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AFTER THAT pleasant little prophecy I was not surprised to find Callahan buried ten deep in a crowd that was begging him to give again the formula and technique of using rosin in root canals. When I first noted the aggregation of men, each with his pencil and pad, for just an instant I was afraid that Callahan was giving the history of his life to the Associated and Local Press, but on second thoughts I knew better than to class him with those who let the newspapers tell the Dear Public what Great Men they are.

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SIDLING INTO THE THRONG I soon discovered what it was these men were after, and in order to rescue Callahan I recklessly remarked: "Let him go, boys, and I will print it all in the next talk 'Around the Table.' " Which you see was a promise, and being a promise must be kept, else Callahan will lose his life when next captured.

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I MUST THEREFORE give you Callahan's technique, but first let me once more remind you that he does not fill the root canal with rosin. The rosin is, as he calls it, an "adjuvant." The solid filling is the gutta-percha. There is also chloro-percha, but curiously enough no chloro-percha is **introduced** in the canal. It is **made** in the canal. Told quickly the method is as follows: First the rosin solution is introduced to seal the dentinal tubuli and to aid in sealing the apical formamen. Next a gutta-percha cone is inserted, and this is pumped up and down. In this process two things occur. Chloro-percha is produced by the solution of the gutta-percha in the chloroform of the rosin solution. At the same time the cone is slowly reduced in diameter by this solution, each pumping act driving it farther towards the apex.

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I RECALL that one gentleman especially asked: "How can you get the thin solution of rosin up into a fine canal in an upper tooth." As he seemed to anticipate no trouble with lower teeth, I was tempted to suggest that for upper teeth the patient should be stood on the head. But we must not jest.

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TO INTRODUCE the rosin solution into the canals of upper or lower teeth, use the finest of the Young Aseptic broaches. This broach is so constructed that it will retain the merest whisp of cotton twisted on it. Saturate this with the solution and carry it into the canal. Then repeatedly withdraw and press in again this broach with cotton, this forming a syringe of which the canal is the barrel, and the broach and cotton the piston.

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BUT LET ME quote Callahan's own language in regard to this technique: "The technique of the rosin gutta-percha root-filling is simple, easy, quick, and sure to seal all tubuli and foramina that are open. To make the following technique possible a root-canal should be of the general shape of the fine paper root-canal driers as furnished us by the dealers. In addition to this general form, have the mouth of each canal a decided saucer shape. This will facilitate the placing of agents, or instruments to, or near the apical foramen. The first step then is, as nearly as possible, the complete dehydration of the dentin, using acetone, as advised by Dr. Prinz, as the dehydrating agent. After flooding the canal with acetone, use the paper points liberally until the canal is entirely free from moisture. Follow this with warm air. Then hold a warm wire in the canal for a minute or two, being careful that the wire is **not hot enough to scar** any part of the canal.

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"RIGHT HERE is where many root-canal operations fail. The canals and tubuli must be as dry as it is possible to make them, bearing in mind that it is possible to do damage by overheating the root. Now flood the dry canal with the thin rosin solution. Twelve grains of rosin dissolved in three fluid drams of chloroform is about the proper formula. Pump it in with a wisp of cotton on a broach. When the canal is full of the solution, pass a fine wire, or broach, to the end of the canal. Work out all the air that may be trapped therein. This is of vital importance.

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"SELECT A GUTTA-PERCHA CONE that is about two-thirds the length of the canal, holding the cone with a fine foil carrier. Pass the cone carefully and surely about half way into the canal, pumping the cone up and down in the canal, usually from forty to sixty

times, and as it dissolves in the chloroform, advance the cone farther toward the apex. The pumping motion forces the rosin solution farther into every opening. The chloroform at the same time dissolves the periphery of the gutta-percha cone, which, becoming more and more attenuated, slips farther toward the apex, surrounding itself with a mixture of gutta-percha and rosin. The rosin seals the tubuli and at the same time causes the gutta-percha to stick tight to the pulp walls, and makes the gutta-percha more stable and proof against the action of body fluids or substances. If this does not leave the large end of the gutta-percha cone, at or near the occlusal end of the canal, place a small cone along side of, or on the first one. Then with cold steel plugger points that will go into the canals, gently pack the mass into the canal, using warm air to soften the protruding gutta-percha if necessary.

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"THIS PACKING forces the semi-fluid (chloro-percha and rosin) into unknown canals and pockets, and at the same time brings the surplus chloro-percha to the mouth of the canal where it may be taken up with absorbent rolls of cotton. If this technique be followed it will be noticed that the chloroform has been used up or very nearly eliminated. In packing the root-filling with the steel plugger the rosin and gutta-percha is inclined to stick to the plugger. This can be completely overcome by slightly heating the end of the plugger, then thrusting the instrument into a paraffin cake. The instrument will take up enough paraffin to prevent the contents of the root-canal from sticking to the plugger point. Have on the bracket a small glass cap bottle which has been filled with chipped paraffin; the bottle is set in hot water until the paraffin melts down. When this has been allowed to cool we have a cake of clean paraffin enclosed within the bottle, useful in many ways. You may ask: 'Do you succeed in filling all canals and tubuli to the farthest extremity.' No, only those that are open and dry to the farthest extremity."

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ON ANOTHER occasion I barely discerned Rhein completely surrounded by an eager mob of men asking questions about his technique. One particular query was in regard to the use of Schrier's sodium and potassium in root canals, and again I pacified the crowd with a promise to print. But I have given so much space to Callahan (not an inch of which do I regret) that I must ask indulgence until next month for a talk on sodium and potassium. 1914.

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COMMENT. It is noteworthy that these early Table Talks were largely devoted to root canal technique. The same might be said of dental

❖ Table Talks everywhere today. More than ever, now that the
❖ Focal-Infection-Bug-A-Boo is always with us, we want to know
❖ when to fill root canals and if so, How? ❖ ❖

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ROOT CANAL THERAPY being still the most important unsolved
❖ problem, in selecting matter for publication I think it well to give
❖ most, if not all, of what has been printed in our Table Talks, because
❖ thereby we obtain a sort of chronological record of the various
❖ views that have been entertained from time to time. ❖ ❖

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CALLAHAN WAS ONE of our best and most conscientious workers
❖ in this field of research, and what he presented to us under the
❖ name of the Chloroform-Rosin technique contains much of value.
❖ At the very outset however my attention was particularly directed
❖ to Callahan's statement that after flooding the canal with the
❖ chloro-rosin he selected a cone, and holding it in fine foil carriers,
❖ he would pump it up and down in the canal, "usually from forty to
❖ sixty times," the gutta-percha cone slowly dissolving, and there-
❖ fore passing farther and farther into the canal. ❖ ❖

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THIS TECHNIQUE is admirable where it can be practiced. But it
❖ simply cannot be done in many canals so fine that any cone that
❖ would pass into the canal half its length, would be so slender that
❖ it could not be pumped up and down. ❖ ❖

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THEN AGAIN there are canals so fine, that the finest gutta-percha
❖ cones made would scarcely enter the canal more than a quarter of
❖ its length, and then only because the entrance to the canal had been
❖ enlarged. 1928.

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VII.

IT WAS RECORDED in our last issue that at Rochester I made a promise ❖ to describe the use of sodium and potassium in the treatment of ❖ root canals. I cannot do better perhaps than to report a conversation ❖ that occurred in the Dutch Grill of the Hotel Powers. A ❖ gentleman from Cleveland remarked: "I listened with much interest ❖ this morning to Rhein's lantern talk on root canal treatment ❖ and filling. It was enlightening to see radiographs of roots improperly ❖ filled by the previous dentist, and other radiographs of these ❖ same teeth cleaned out so that wires in the canals were shown in ❖ the radiographs to be at, or through the apex. I am willing to admit ❖ that he has done this, because otherwise he could not have the ❖ radiographs, but I do wish he had more fully explained the technique. ❖ It does not enlighten me much to hear him state that with ❖ sodium and potassium he succeeded in reaching the end." ❖ ❖

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"I AM GLAD YOU brought that up," said a man from Minneapolis. "I ❖ bought a bottle of that stuff once, and used it in a root canal without ❖ any benefit whatever, and I sealed it in three times at that. But ❖ at the fourth sitting I could get no farther up the canal than at ❖ the first sitting. And what was worse, by that time the whole bottle ❖ of the stuff was useless; turned to a dry powder." ❖ ❖

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"SODIUM AND POTASSIUM is not to be used in that manner," said ❖ I. "If you wish I will describe the technique." Having obtained ❖ unanimous consent, I continued: "Sodium and potassium was introduced ❖ to the profession of this country at the World's Columbian ❖ Dental Congress and in value is worth all the money spent on the ❖ Congress. It was presented by Dr. Emil Schreier, of Vienna, and ❖ the best preparation is that put up under his supervision, and imported. ❖ Another preparation, put up in this country, is in small ❖ phials the object of which was to meet the complaint that the agent ❖ rapidly disintegrates by oxidation. Hence the smaller the package ❖ the less the loss. As a matter of fact the reverse is true, as it is ❖ almost impossible to preserve the contents of the small phials once ❖ they are opened, so that the final expense is greater than with

❖ Shreier's package. This is shaped like a short test tube, the sodium ❖ and potassium appearing like an amalgam, covered at the top by ❖ about a quarter of an inch of paraffin. In order to reach it, an in- ❖ strument is used to puncture a hole in the paraffin, thus gaining ❖ access to the sodium and potassium compound, but immediately ❖ after the treatment of a tooth the hole in the paraffin should be ❖ closed by pressing into it a warm burnisher. This prevents the ❖ oxygen of the air from reaching it, and as it has a tremendous ❖ affinity for oxygen, if this precaution is not taken it will rapidly dis- ❖ integrate by oxidation. ❖ ❖

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"SODIUM AND POTASSIUM is not primarily intended for use in ❖ canals in which living pulps are present. Nevertheless, in cases ❖ where pressure anesthesia has not been entirely satisfactory, or where ❖ the removal of the pulp has not been certainly accomplished, the ❖ compound may be used to good purpose. It is, of course, most ❖ undesirable to leave a terminal filament of the pulp at the apex, ❖ since by the following day when all effects of the anesthetic will ❖ have passed off, this filament will be found very much alive and ❖ exceedingly difficult to anesthetize. Where doubt exists, therefore, ❖ it has been my practice, after controlling the hemorrhage, and be- ❖ fore the anesthetic effects have disappeared, to use the sodium and ❖ potassium compound for extirpating the remains of the pulp, just ❖ as one would proceed in the presence of dead tissue. ❖ ❖

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"THE METHOD of using sodium and potassium is as follows: Select ❖ the finest of the Young Aseptic broaches, and, having made a hole ❖ through the paraffin, push the broach down into the compound. ❖ It will come forth evenly charged with the amalgam-like mass, and ❖ must be used immediately, as the compound oxidizes rapidly when ❖ exposed to the air. Therefore the rubber dam should be in place, ❖ the cavity cleared of all débris and ready access to the opening of ❖ the canals must have been procured by freely cutting away the oc- ❖ clusal surface. Let us suppose that the opening to a canal has been ❖ found, but that a fine clean broach has failed to penetrate more than ❖ a quarter of the length of the canal. We desire, with the aid of ❖ the compound, to clear out this canal to the apex. The fine broach, ❖ freshly charged with the compound, is forced into the canal as ❖ far as it will go, using an up and down stroke. A rotary movement ❖ may also be exerted, but only with the greatest caution. Have the ❖ following axiom constantly in mind when working in root canals. ❖ A broach will never break if moved only forward and back in a ❖ canal, but may and often does break when rotated. The reason is ❖ simple. If the end jams it can best be dislodged by a straight back-

❖ ward withdrawal. It can often be broken by rotating it. Therefore ❖
❖ avoid rotation of a broach as much as possible. ❖ ❖

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"THERE IS ONE other thing needed besides the sodium and potassium ❖
❖ in reaching the end of a canal. This fine broach naturally carries ❖
❖ but a very small dose of the compound to the part of the canal ❖
❖ which is filled with partly calcified material. Therefore time is re- ❖
❖ quired. The story will be like this. Charge the broach with the ❖
❖ compound and pump the instrument gently back and forward a few ❖
❖ times. No progress! Cleanse the broach, and recharge it. No ❖
❖ progress! Repeat the process. No progress! Repeat the process. ❖
❖ No progress! Repeat the process. No progress! Here some im- ❖
❖ patient men abandon the treatment, and wander around dental ❖
❖ meetings declaring: 'There is nothing in that sodium and potassium ❖
❖ treatment. I have tried it.' Other men proceed as follows: Re- ❖
❖ charge the broach, pump back and forth. 'Ah! That went a little ❖
❖ deeper!' Repeat. 'Ah! A little deeper still!' After which the ❖
❖ progress is usually satisfactorily rapid. In many cases the calcifica- ❖
❖ tion of the pulp has built a bridge across the canal which prevents ❖
❖ ingress, and it takes some time to break down this mass chemically ❖
❖ by the action of the sodium and potassium, but having passed this ❖
❖ point the balance of the canal may be fairly easy. And it is exactly ❖
❖ this class of unfilled root that gives trouble because the dentist by ❖
❖ stopping at the bridge, as it were, leaves imprisoned in the canal ❖
❖ beyond, a considerable mass of material which is most attractive ❖
❖ pabulum for bacterial organisms. ❖ ❖

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"SOMETIMES, however, the entire canal is filled up with calcific material ❖
❖ and there is no such satisfactory result as to find the broach sud- ❖
❖ denly passing the bridge and plunging forward into comparatively ❖
❖ clear space. It is these cases of almost complete calcification that ❖
❖ test a man's patience as well as his ability to convince his patient ❖
❖ that the service will be worth the time and money expended upon ❖
❖ it. Yet both may be done. ❖ ❖

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"BUT IT IS NOT alone in the presence of calcific material that sodium ❖
❖ and potassium is valuable. It is a magnificent agent for sterilizing ❖
❖ infected canals, and even may be relied upon to sterilize the tubuli. ❖
❖ Its power as a germicidal agent was well proven in a series of tests ❖
❖ carried on a few years ago, with the assistance of a competent bac- ❖
❖ teriologist. The operator was supplied with sterilized glass tubes, into ❖
❖ which broaches to be tested were placed by first breaking off one ❖
❖ end of a tube and then, after introducing the broach, resealing the ❖
❖ tube by melting the end in an alcohol flame. Some of these broaches

were bare broaches used for exploring infected canals. Others were broaches which had been charged with sodium and potassium and then used for sterilizing the canals. Some of these latter were even dipped directly into pus. In all cases cultures were procurable from the dry broaches used, but in no single instance could a culture be obtained from any of the broaches which had been charged with the sodium and potassium."

"HAVE YOU ever had any pain or trouble," asked an Atlanta man, "from having the compound pass through the end of the root? I have had considerable pain from having a tiny particle drop on the back of my hand, and I do not think I would care to have it go beyond the apex."

"ONE SHOULD certainly be cautious in young teeth, or any teeth having large foramina. Yet after twenty years' experience with the compound I do not recall a single case of irritation, or trouble of any sort. It must be remembered that it is to be used only on the finest of broaches, and that it oxidizes so rapidly that it is frequently difficult to get a good dose of it far up into a canal. Usually, therefore, one need have no anxiety on that score."

"DOES THIS COMPOUND sufficiently cleanse out a canal," asked a friend from Columbus, "so that one may immediately fill it?"

"THAT IS A TIMELY question. It does not cleanse the canal at all. Where calcific material is present it breaks down their solidity so that the particles may be picked out. And where only soft tissue is present, by chemical combination it forms a mass almost resembling green soap. After treating a canal which may have appeared clean prior to treatment, it will be a revelation to many to see the débris that may be removed. This after-treatment includes syringing with peroxid of hydrogen into which is mixed mercury bichlorid (1 to 500), after which I prefer to go further and cleanse the canal with whisps of cotton wound on the finest of the Young broaches and dipped in the same peroxid solution. When these bits of cotton are withdrawn they should be removed from the broach onto a napkin, when they will appear as a green stripe. A new whisp is introduced and the process continued so long as these bits of cotton show any color, after which the syringe should be again used, followed by clean sterile cones of bibulous paper for removing the moisture."

"I AM GOING to try it," said the Cleveland man. "Ditto likewise," re-

❖ marked the others present. "I wanted to ask someone to tell me
❖ the best method of applying arsenic," said the Atlanta man. "There
❖ is no best way," said the Minneapolis dentist, "all methods are bad."
❖ "Oh! I don't know about that," said our friend from Cincinnati.
❖ "But it is too late to tell you about it to-night. To-morrow night,
❖ perhaps." 1914.

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COMMENT. In one place in the above Talk I recommend the use of
❖ sodium and potassium even after the removal of a living pulp.
❖ The advice is still sound, if one intends to fill the canal to the end
❖ of the foramen—the visible end as seen in a radiograph. But if
❖ the more modern doctrine is accepted, and you wish to carry your
❖ canal filling only to the dento-cemental junction, you should not
❖ of course introduce sodium and potassium, nor any other caustic,
❖ since it is highly important that the apical tissue shall not be in-
❖ jured beyond the necessary trauma of tearing the pulp away. 1928.

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VIII.

I AM DISAPPOINTED. Really I thought when I started for Europe that I would return just loaded up with "table talk." Fact is I had hardly set foot in France, before all Europe began declaring war. France was courteous enough to give us twenty-four hours' notice to quit the country. Personally I managed to make it in twenty, and reached London in time for the International Dental Congress. But just as soon as I read my own paper, they closed the Congress. Cause and effect, I suppose.

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THUS I HAD VERY few opportunities to sit quietly with confreres and discuss dental topics. Of course, I met a few men, as for example on the boat going over, but the most important subject with them all seemed to be the question: "If it gets rougher, and the ship starts rolling, would it be advisable to take Mothersills?" In Paris it was just as bad. In the open air café at the Continental, the talk was all about whether there would or would not be war. At the Moulin Rouge one was asked: "Did you ever see the like?" At the beautiful dinner at Armenonville, where the ladies dined with us, the comment was: "Why don't we do this in America." In London it was no better. Whether in the Lounge at the Savoy, in the Lobby of the Cecil, at luncheon at the Ritz, dining at the Piccadilly, or discussing one of those wonderful joints at Simpson's, only two topics were discussed. "Have you recovered your luggage?" and "Do you think we will be obliged to go home in the steerage." Occasionally a man said a word or two about Uncle Sam sending transports, but no one went into transports at the prospect.

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SO ALL THE WAY back, when I was not leaning over the rail looking for a German cruiser, or peering through the fogs, or gazing at the beautiful iceberg which passed us coldly by, I was wondering whether the boys would meet me at the boat with a band, rush me off to a Grill or a Roof Garden and talk shop long enough for me to pick up a few stray bits to chat about. But sad is my lot! They have heard about the war over here, and all I can get out of folks is: "The Kaiser did!" or "The Kaiser didn't!" or, "Will the Kaiser?" or "Won't he?"

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IN THIS PREDICAMENT I grabbed up half a peck of letters that had arrived during my absence, and went up to a quiet spot in Central Park, far, far from the telphone's tinkle or the newsboy's sonorous song. And lo! in the lot I found three letters which fit together singularly well. They are so totally different.

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BEFORE WE GO any further let me distinctly declare that I am not here inaugurating any attempt to publish talks on business management. The aim of "Items of Interest" is to tell you how to do your work, not how much to charge for it, nor how to collect your bills. Nevertheless we may turn aside from the regular rut for just once in response to the following appeal.

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IN ONE OF THE letters I find the following from a good friend of mine, a gentleman in Kentucky. He says: "Will you give me your frank opinion on the following: Is it not true that he who can profit by the experiences of others, is the man who succeeds the fastest? Take away the avenues of learning after graduation, and what progress would be made by the individual? We have had some articles on office management, efficiency, and business talks. But what has been printed on various means of establishing a practice? Why withhold such knowledge from the worthy young man, and leave him by bitter experience to get through and around the pitfalls that he is sure to encounter? Your 'Around the Table' is a good department. Why could you not give us in it a talk on practice building. You need not recite personal histories, but perhaps you could weave a story based on the experiences of prominent and successful men. I have made bitter mistakes myself, but by questioning others I have obtained many good ideas. Yet there is much that I would like to know. Does dental literature give me and others like me any enlightenment?"

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I HAVE PRINTED the above appeal in full, because of my reluctance to launch this magazine into any campaign of business talks, and thus it will be understood that I turn aside from this fixed policy only because at the moment it seems to me that the claim of my Kentucky friend is just. It is true that the young man is left altogether too much to his own resources in gaining a foothold in professional success. Considering the selfish indifference of the majority, what wonder that these young feet slip at times and that they wander into paths unprofessional but more immediately remunerative!

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THEREFORE I will cheerfully accede to the request of my Kentucky friend, especially as I believe that I can give some hints that may

prove of use. It happens that some ten years ago I gave such a talk to the Alumni and graduating class of the University of Buffalo. A month ago in Paris I was invited to take luncheon with an American dentist, in his truly sumptuous offices, on a fashionable boulevard. He showed me over this place, reminding me of the above mentioned lecture; he recalled that he had accompanied me to my hotel after the meeting for a further talk on the same subject and then, waving his hands about his rooms, he said: "Doctor, I owe all this, all my success to you; to the advice that you gave me that night!"

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THIS, OF COURSE, is not true. No man owes success in life to anyone but himself, except in a purely subjective way. Yet it is true as my Kentucky friend says that, "he who can profit by the experience of others, is the man who succeeds the fastest!" And the one or two bits of advice which I can give have been proven of value by myself and numerous others besides the gentleman in Paris.

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BUT FIRST LET me reproduce, at least in part, the two other letters to which I have alluded. The first, because it seems to point out some of the pitfalls that are difficult to avoid; the second, because the writer most adroitly gives us a pen picture of many of the humans that we must serve.

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THE FIRST LETTER is signed "James Ernest," and is postmarked in Connecticut. That is not the gentleman's real name, but James is certainly in earnest, and evidently has had some experiences which will be familiar to many, and may well be seriously studied by those just starting out. Therefore peruse, digest and profit by what James Ernest tells us.

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"WHAT ARE YOUR feelings when you visit a cemetery? You are sad, rather than mad, are you not? Have you a cemetery in your office? No? Lucky man! Or liar perhaps! Anyway, I have one in mine, and every time I bury a dead-beat I am Sexton, Minister and Mourner, all in one. Chiefly Mourner. I just hate these funeral functions, and I am tired of reading such epitaphs as 'Sacred to the Memory of Profit and Loss!'

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"BUT WHAT CAN WE DO? Where find a remedy? Yet there should be one. If a bricklayer were refused payment for the last hour of a day's work, he would hurl aside his trowel and precipitate a strike which would tie up the whole works. I hope I am as professional

❖ as my neighbor, yet even the preacher receives his stipend for his ❖ preachments. There was a time when I could proudly boast that ❖ there were no bad accounts on my books, but alas, that day has ❖ passed, I fear, like the bloom of youth, never to return. My but that ❖ was a grand old time! Just out of school, and needed the money! ❖ Hence the rule: 'Cash at every sitting,' and patient and dentist ❖ both satisfied. Then stalked into my office that beguiling gentle- ❖ man, Mr. Credit, and soon thereafter occurred the first interment ❖ in my business graveyard. Friend, will you saunter with me under ❖ the weeping-willows and let me recite to you the brief histories of ❖ a few of my buried dead? ❖ ❖

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"OBSERVE THIS tiny headstone? Only a small grave this one. The ❖ bill rendered was for five dollars, and the date of service two years ❖ back. The young Miss, a daughter of a retired physician, returned ❖ with the bill in one hand and two-fifty in the other, and placidly ❖ informed me that her 'mother said that was quite enough to pay ❖ for what had been done.' Neat, wasn't it? Quite simple, too, and ❖ can be utilized by almost any young person. ❖ ❖

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"THIS BLACK STONE marks the resting place of a young man, a ❖ stranger who paid me two visits and received a gold crown. Nothing ❖ was said about payment until the crown was firmly cemented in ❖ place, when he informed me that he had brought no money with ❖ him as he had not expected me to finish that day. Shades of ❖ Blackstone, what can a busy dentist do with a case like that? What ❖ did I do? Well, by the end of a year I collected all but one dollar, ❖ less twenty per cent. to a collector. By the way, that bill collector ❖ is a sort of silent partner of mine, and he earns his commissions at ❖ that. ❖ ❖

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"A NEAT VARIATION of the above is a promise to pay as soon as the ❖ work is completed. Can you ask a lady to do more? When the ❖ bridge is set beyond removal, the lady discovers that she left her ❖ pocketbook at home on the piano. This trick is usually a com- ❖ plete success. At least, I have a whole row of such 'remains' in my ❖ cemetery. ❖ ❖

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"THERE WAS ONE WOMAN, a champion in her class. Talk about ❖ theft from the person? This was like grabbing a man's purse on ❖ the highway and telling him to wait; that you are just going to the ❖ corner grocery to get some change and will be right back. This ❖ feminine hold-up person was of regal manner; perfectly ladylike and ❖ carried things off in the 'James! Call the carriage' style. She was

❖ a casual patient, that is without appointment. Had a cleansing and
❖ several fillings. Then asked for my bill, expressed satisfaction, and
❖ pleasantly informed me that she would step over to the bank and
❖ get some money. Why! I thought she must be the banker's wife!
❖ But later I learned that the banker was a bachelor. ❖ ❖

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"THIS MONUMENT was erected to the memory of a lady of moderate
❖ means who owes two dollars balance, but refuses to pay because a
❖ friend declared that I had overcharged her. Next to her, is a
❖ woman who owes four dollars for a filling done for her daughter.
❖ Declines to settle because she had told the girl not to have the work
❖ done. This grave with the For-get-me-nots growing on it, recalls
❖ a case of unfinished treatment for a daughter of a physician. The
❖ doctor wrote that being a medical man, if his daughter needed 'treat-
❖ ment' he would do it himself, and I need only concern myself with
❖ fillings. ❖ ❖

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"IN THIS VAULT I place uncollected accounts against men whose
❖ wives supply and handle the cash. This genus homo dresses well,
❖ is the most friendly, sociable cuss imaginable; wants his mouth put
❖ in perfect order, regardless of time or expense, and then blandly
❖ tells you to send the bill to 'Wee Wifey.' In the first experience of
❖ this sort, 'Wee Wifey' called and proved to be a thorough business
❖ woman. For a discount of thirty-three per cent. she would settle.
❖ Why argue with a lady? I settled. ❖ ❖

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"JESTING ASIDE, why should we not receive full fees for what we
❖ earn? Some of you will laugh and say: 'If he had a practice like
❖ mine, he would not be bothered with bad accounts.' It is well
❖ enough for those who are practicing in ideal environments to talk
❖ thus, but the average dentist works under poor conditions, and gets
❖ low prices for his work. He also must cater to people who try to
❖ save money on dental bills just as they do when buying food or
❖ clothes. It is an ideal proposition, of course, to have patients who
❖ permit you to do what you please, charge what you please, and who
❖ send a check on receipt of bill. But how many of us have patients
❖ like that, and to those who have not, what is the best solution of the
❖ problem of receiving a fair return for services rendered?" ❖ ❖

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HERE ENDETH the recitation of woes by James Ernest, and in con-
❖ clusion he asks a question the answer to which would be helpful
❖ to many, especially to beginners. But let us leave that for the
❖ present, and cross from Connecticut to Massachusetts to learn
❖ whether experiences differ much in these adjacent territories. The

following is contributed by Dr. Horace F. Gleason, of Malden, who informs me that he has had thirty years of experience. He declares that he wishes to offer "A few Don'ts for our younger brothers, and as a gentle reminder to older ones." Here they are.

"DON'T BE LATER than 7:30 A. M. in reaching your office, nor leave before 9 P. M. Remember you are there solely to serve your fellow men and women. Someone may have an ache, between these hours, and may need you.

"DON'T GET PEEVISH if you wait till eight o'clock at night to extract some teeth for Mr. Jones, and he fails to bring any money with him. It is your part to do good, and his part to do you, if he can.

"DON'T BE SURPRISED if Miss Araminta Brown advises her friends not to patronize you because you smoke. And try to forget that when you worked for her, her breath reminded you of a last year's 'fresh egg.'

"DON'T CHARGE more than three dollars for a porcelain crown, nor more than five for a gold one, and include 'treatment and filling of roots.' Your patients can tell you of many 'first-class dentists' who charge no more. Anyway, they need the money for other things.

"DON'T OBJECT if Sallie Smith makes four separate appointments and fails to keep them. No doubt she 'had campany,' or 'Jack came to take her for a ride.' She will surely explain it to you when she makes her sixth appointment.

"DON'T REFUSE TO WORK all day on Sunday. People can't be expected to lose any time from their own business just to accommodate you. So you must cheerfully work for Jews on Sunday mornings, and for Christians in the afternoon, because the latter must attend Divine Services in the mornings. If Sunday should prove to be sunny they may all go automobiling, both Jews and Gentiles. Well! Never mind! That will enable you to read your Sunday paper.

"DON'T BE ANGRY if some one makes a contract with you for forty dollars for work well worth sixty, and after three years refuses to pay the last ten dollars because 'one of your fillings did not stay.' Use better cement next time.

"DON'T WORRY YOUR PATIENTS about their bills until their accounts are over three years old. If you do, you may lose their custom.

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"DON'T MIND IF some important patient, for whom you have done careful and conscientious work, goes to a 'brother' dentist, because 'your work was not up to standard.' Doubtless your 'professional brother' has waited a year or more for an opportunity to explain how poor your fillings are and how much better and newer his method is.

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"DON'T TAKE A VACATION, or if you do, don't be gone over a week, because Mrs. Henrietta Julia Brown-Sequard will almost surely call while you are away, despite the fact that you gave her a month's notice of your intended absence.

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"DON'T REFUSE to repair without charge the plate you made for Mr. Thompson last year, and which he returns with the six front teeth off, explaining that he was only eating soft bread. Bread is the staff of life, and you can't expect your patients to live on soup just because your plates are weak.

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"IN SHORT, DON'T bother about your own health or cater to your own comforts. You are a professional man, a public benefactor, and should be glad you are alive and enjoying the opportunity to do a few trifling services for your fellowmen. Thus live your life and when you die and your friends 'chip in' for the funeral expenses, no doubt the local paper will mention your passing, and allude to your few virtues, at the same time noting that 'the widow and her three children have gone to her father's home.' Verily! Verily, blessed are the meek, for they shall inherit the (six feet of) Earth! Ah-men!"

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THE COMMUNICATIONS of these gentlemen have proven to be so interesting that I have been unable to curtail them sufficiently to leave room for my promised reply to my Kentucky friend. I had hoped to conclude this chat, but shall be obliged to resume the discussion next month. 1914.

COMMENT. In the letter from "Dr. James Ernest" mention is made of the lady who declined to pay four dollars for a filling done for her daughter because she had told the girl not to have the work done. At the time when this was printed I looked upon this largely

❖ as a joke. A sort of four dollar joke, because one would scarcely
❖ test the mother's contention legally to recover so small a sum. ❖

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BUT WHEN, A FEW YEARS LATER, a father refused to pay for about
❖ three hundred dollars' worth of work, on the ground that the "boy"
❖ (he was six feet tall) was a "minor," and he, the father, had not
❖ authorized the work, the matter assumed a different aspect. ❖ ❖

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I BROUGHT SUIT, and the Judge decided in favor of the Father.
❖ Thus I learned, that at least in New York State, a parent cannot
❖ be held responsible for dental services for a minor child, unless he
❖ has authorized it. ❖ ❖

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A LITTLE INCIDENT, which occurred after the case had been decided
❖ carries a moral—perhaps. A young dentist came up and introduced
❖ himself, stating that he had been in Court and that he considered
❖ the verdict unjust. Said I to him: "Well, my young friend, you
❖ have at least learned the law in this state, and hereafter you may
❖ be careful not to work for minors without specific sanction from
❖ the parents." ❖ ❖

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"OH! DOCTOR," he replied, "the law does not apply to me at all. I
❖ am what you call a 'pay as you enter' dentist." 1928.

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IX.

IN THE LAST NUMBER, my friend from Kentucky asked a question, which is here repeated that the topic may be fairly before us. "We have had articles," said he, "on office management, efficiency, and business talks. But what has been printed on various means of establishing a practice? Why withhold such knowledge from the worthy young man, and leave him by bitter experience to get through and around the pitfalls that he is sure to encounter?"

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THAT IS THE QUESTION, and I promised to discuss it.

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WHAT WOULD YOU think of a man who jumped into the sea, and then cried out: "Ho, there! Some one jump in and show me how to swim!" Would you not consider that he was a bit late in recalling that he who plunges overboard should have previously provided a means of survival when he found himself in deep water?

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YET IT IS undoubtedly true that this is exactly the situation in which all too many young dentists find themselves immediately after graduation. Daddy goes to a dentist and has some bridgework done, and when he gets a bill for $12,576.75 he concludes that dentistry is a "paying business," and he sends Son to a dental college.

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AND WHEN SON ascends the white marble steps of the Dean's Palace and announces that he wants to matriculate, does that Dean ask the boy: "Have you any idea how you will get a practice after you get your sheepskin?" Yes he does—not! But if some day some Dean should ask such a question, what would Son say? He would admit that the question had never occurred to him, and that he did not know the answer.

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FACT IS business men's sons have no right to attend dental colleges at all. Dentistry is not a business, though, of course, a practice should be managed in a business-like manner. Time was when a medical man never sent out a bill, or if he did it was sent in blank; merely a gentle hint, or reminder, and the G. P. (grateful patient) would straightway write out a nice little check and forward it to the Dear

Doctor. This was called an Honorarium. But after a time some patients abused this Honorarium method of settlement with Doctors, and the method began to grow unpopular—with the Doctors.

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SO NOWADAYS doctors, and likewise dentists, send out bills, with the service fee written in plain figures, and really it is just as well as things are, because so few would know what an Honorarium is, any more than a friend of mine who asked me if it was not a new idea to declare a "natatorium," as so many countries have done during this war. But even so, while it is perfectly just, proper, and right to have fixed fees, and to collect real money for services rendered, nevertheless dentistry is not, or, at least, should not be looked upon as a "business."

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THEREFORE A YOUNG man entering the profession should do so just as he would join a Masonic order; not because of what he might get out of it so much, as with the full intention of being an honor to the honorable body with which he thus associates himself.

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CONSEQUENTLY SINCE he elects to become a professional man, he should realize at the outset that he is in honor bound to abide by the rules of the Fraternity, and that an infraction of these rules is more of a disgrace to himself than to the Brotherhood whose tenets he has promised to obey. Yet how often, at the very outset of his career does the young graduate take a step which is likely forever to ostracize him from the company of the best of his professional brothers, and all because in advance he neglected to ask himself: "How shall I get into practice?"

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A FEW YEARS AGO a young man came to me seeking a position. He told me two things that were astounding, considered together. First that he was a graduate of one of our best university schools. Second that he had been employed for a year in one of the most notorious dental parlors in the city. "Were you not taught in College," I asked, "that the majority of these dental parlors are pernicious, and that no professional man can be connected with them?" This he admitted, and then I asked: "Why have you worked for such people, prostituting your profession, your Alma Mater, and yourself?" This galled him and with a little heat he replied: "I had to live!" Like a flash I retorted: "I do not admit that. You do not have to live, or, at least, not at the expense of dentistry. Men like you might better die than live."

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HARSH AS THAT may sound it is as sound as Gospel. Before a man

❖ enters an honorable profession, before he applies for and accepts
❖ that education which could not be transmitted to him but for the
❖ text books and teaching of truly professional men, he should study
❖ out the problem of how to use his professional education, in a pro-
❖ fessional manner. ❖ ❖

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OF COURSE, to the Son of a successful dentist there is no problem as to
❖ entrance into practice. He will first assist and then succeed his
❖ Father. To the Son of the business man who essays to become a
❖ dentist for "what there is in it," I have no advice to give. To the
❖ young man who finds occupation in a dental office in some capacity,
❖ and finally, growing to like the work seeks the required education;
❖ or to any young man who, with his eyes open to the fact that a pro-
❖ fession is no high road to fortune, but who from natural predilec-
❖ tions, wishes to be a professional man rather than a tradesman, I
❖ cheerfully offer a few random thoughts. ❖ ❖

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AT THE VERY OUTSET let me say that the acceptance of the position
❖ of assistant with an older man is like a double-edged sword. There
❖ are advantages in such an alliance, but there are serious drawbacks.
❖ If the older man is skilful, the younger man may learn much from
❖ him, but do not overlook the fact that the possession of a large
❖ practice does not necessarily attest either to practical ability or
❖ professional attainments. There are "business men," even in the
❖ higher walks, masquerading as professional men, and I might add,
❖ masquerading as dentists. Men who are just natural born sales-
❖ men. Such men "sell" amalgam fillings under the name of plati-
❖ num, "which, as you know, is very expensive just at present." They
❖ speak of the silicate cements as "the new seamless porcelain fillings."
❖ And their gold fillings are seven-eighths oxy-phosphate to "protect
❖ the delicate pulp from thermal shock." In such offices pulps are
❖ "capped" so as "to preserve the vitality of the osseous structure of
❖ the tooth as long as possible," and fistulous openings from alveolar
❖ abscesses are "an advantage since they afford free drainage from the
❖ gum boils." ❖ ❖

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BUT EVEN IN THE OFFICES of the best grade of dentists, offices in
❖ which the young man may undoubtedly learn much, there is a limit to
❖ the advantage of such association. Let the young graduate realize
❖ that finally he must establish a practice for himself; one in which the
❖ patients owe allegiance to him, and not to another man. His inex-
❖ perience and lack of faith in his own judgment may hamper him at
❖ the outset if he embark alone, but if he have average or more than
❖ average ability the satisfaction of his patients will rapidly give him

confidence, and from that moment he must be increasingly successful as a practice builder. Then why build for another man? I place the advisable limit of such an association at five years, and three might be safer.

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IN FORMING an alliance, the most important clause in the contract should be to the effect that "at the end of the term of this contract the party of the second prat shall be at liberty to enter into practice for himself, and to work for any patient who may have been placed in his charge by the party of the first part, provided such patient may seek such service unsolicited, except that the party of the second part may mail to all such patients a card announcing that he has terminated his association and has removed to his new address."

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SUCH AN AGREEMENT made in advance, would avoid much possible ill feeling, and prevent enmities such as have lasted through life. The older man will place a family in the care of his assistant; usually a family for whom he does not himself wish to work. This family from a purely business standpoint is the "property" of the older man. Being pleased with the young man's services a friend is recommended. This is the nucleus of family No. 2. Also the "property" of the older man. But if the young man continues to give satisfaction he will acquire family No. 3, and then No. 4, and then No. 5. All of these the older man would consider as his because had he not placed family No. 1 in the care of his assistant he never would have seen nor heard of family No. 5. This fact being true, argument is futile. On the other hand the young man declares that if his work had not been satisfactory to numerous intermediate patients the older man never would have seen nor heard of family No. 5. Which is not entirely true, because the same result might have come about had the older man kept family No. 1 in his own personal care. However, this is sufficient to show how easily an estrangement, and even an animosity may arise, which will harass for a lifetime.

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CLEARLY IT WOULD BE BEST to permit the patient to decide to which man he owes allegiance, and therefore the clause suggested, or its substance, should be in all contracts between old and young dentists. Indeed it is of more real lasting importance than the salary.

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WHERE A YOUNG man begins as the associate of another, when he terminates his agreement he should have a nucleus of a practice, especially if he had reserved the right to receive patients himself on

some terms agreeable to both parties. Let us now come to the young graduate who courageously opens an office on his own responsibility. Such a man should join the local dental society as promptly as possible, and to render this easier, the society should remit part of the first year's dues to all who become members during the first year of practice.

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HAVING THUS proven his intention to practice ethically, he should, as far as possible, without unduly intruding himself, cultivate the friendship of the more prominent and successful men, though all professional friendships are of value. If there be one line of work in which the young man especially excels, let him exhibit such work to the older men. Ask permission to take a patient to the office of some man who may have shown some friendly interest, with the avowed intent of receiving criticism. In this way the older man will be enabled to see exactly what quality of workman the younger man may be. If pleased, he will probably send him practice. These older men are constantly being asked by patients: "Can you recommend a young man who does good work? I have a friend who cannot afford your fees." How can the older man conscientiously recommend a younger man whose work he has never seen?

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THIS BRINGS US naturally to the question of fees. Let us for a moment consider what the business man, the shop-keeper would do. Before even opening his doors would he not take account of stock, and estimate the price at which he must sell? It is even more necessary for the professional man to do this. There is nothing harder to accomplish than an increase in fees. Patients whom you serve well at the beginning of your practice, at fees below the value of your services will never leave you, and will expect you to adhere to the established fees sometimes throughout a lifetime. All old practitioners have "old families" of this class for whom it has long ceased to be profitable to work.

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THE YOUNG PRACTITIONER should therefore determine the value at which he would be willing to serve his patient for at least ten years. It will be better to fix it a bit high rather than a bit low. He should endeavor from the very outset to avoid appearing so eager for patronage that he will work at any price. A reputation for cheapness spreads rapidly and is hard to overcome.

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ALL PEOPLE are bargain hunters. From the very outset cultivate the habit of explaining that you are not a "cheap dentist." The patient will ask for some idea of your fees, and if acceptable you are at

once obtaining a client who will pay you your full fees. Too many young men, through timidity or lack of appreciation of their own ability, present bills for less than the patients really expected to pay. Remember that in such cases the patient not only does not pay more than is asked, but he is apt to value your service at the lower price which you yourself put upon it.

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SOME DAY ONE of the Real Rich will arrive. At that moment opportunity knocks at the young man's door. If the rich person be a woman, as it probably will be, she must be cultivated. A dentist should endeavor to do his best for every patient, and to make all clients his friends. But for this particular woman of influence, he must do more than his best, and of her he must make more than a friend. He must not only give his best service at his topmost fees, but he must so treat the patient that she feels under obligation. Without vaunting his own skill let him make it plain that he is of the newer school, and that he is endeavoring to give her the very best according to the latest discoveries.

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A WOMAN FRIEND of this character is the most valuable asset that any practitioner may have, and there is probably no successful dentist who will not admit that he has one or more women of this class, from whose friendship he has materially benefited. This being true the young dentist should be ever on the lookout for her.

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ODDLY ENOUGH SHE may be brought to the young man's office by the humblest of his patients. Let me close by citing an instance from the experience of a professional friend, and let all young men take to heart the moral of the story.

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EARLY IN MY friend's career, when a dollar was worth one hundred cents to him, a stranger came in and asked to have a small buccal cavity in a lower molar filled with amalgam. He agreed to fill the cavity for two dollars. It transpired that the tooth was horribly sensitive and the patient a neurasthenic. The dentist used the utmost patience and his best skill, yet it required more than one hour to fill the tooth. The patient then said: "Doctor, I think I ought to pay you more than two dollars?" But at the outset she had explained that she was a governess out of work, and could not afford a high fee. The dentist was tempted to charge more, but such a course was against his conscience, and he could not fail to abide by his own estimate. So he replied: "It did take more time than I had anticipated, but I cannot charge you any more." Then,

laughing, he added: "Send me a millionaire patient some day, and I will charge the rest to her."

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A YEAR WENT by and this woman called one day with two young girls to have their teeth examined, and an opinion expressed. They were daughters of a genuine millionaire, in whose household the governess had found employment. The dentist expressed an opinion, which subsequently he discovered was opposed to that given by the regular family dentist. That governess persuaded her mistress that the younger man was "up-to-date," and that the older was "an old fossil." The mother called, and the young dentist recognized that opportunity was inviting him. He made a lifelong friend of that Millionairess. She is still his patient. So are her children. So are their husbands, and their children. Also other relatives and friends. Altogether my friend roughly estimates that this woman's friendship has been worth over twenty thousand dollars to him. The governess who brought her has long since passed beyond his ken. But had he increased that two dollars fee, it is possible that he never would have seen the Millionairess. By adhering to his first estimate, he established a reputation for uprightness in the mind of that governess. Likewise he left her in his debt. And she paid the debt.

1914.

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X.

IT IS WORTHY OF NOTE that the S.D.D.S. has held two monthly meetings thus far, and that in each case the attendance was from thirty to fifty in excess of the actual membership, which is not a bad record. By the way, I should explain that S.D.D.S. does not stand for "Some D.D.Ses," but means "Second District Dental Society," "of New York" being understood. Note that "S.D.D.S." reads backward and forward the same, which implies that harmony is the actuating impulse among the members and that whoever at the moment may be the officers, they enjoy the unqualified support of the others. This is as it should be if a society intends to accomplish anything.

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IT WAS AFTER the November meeting, and a few genial and congenial spirits gathered in one of the cosy corners of the Crescent Athletic Club. The other fellows ordered Scotch whiskey, French vermuth, Russian vodka and Munich beer, but, being neutral myself, I had only a glass of Saratoga Springs water. As you will be interested more in what was said, rather than in who said it, I will omit real names, and identify the members of this dental conference by the nationality of the drinks they drank.

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THE TOPIC for discussion at the Society's meeting had been the pathology of the dental pulp and treatment of root canals in general. At the club conference the Scotch person started the talk with this riddle: "Why is a talk Around the Table, like this, similar to a blind abscess? No! Don't try to guess, because in the first place you can't, and secondly, if you do, you deprive me of the pleasure of telling you. Answer: Because just as the germs of disease from a blind abscess may infect the entire physical body, so the germs of truth uttered here to-night by such brilliant thinkers as ourselves, when accurately reported and printed in the journal of our Spring-water drinking friend, may affect the entire professional body of dental workers. Do you see?"

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"I SEE PERFECTLY," said our French friend, "but when you use the expression 'brilliant thinkers,' why so immodest as to include yourself? No! Don't apologize. We know it was thoughtlessness,

❖ which shows you are no brilliant thinker. But let us see what sort ❖ of an observer you are, or, better still, let us apply the test to all ❖ of us. We attended a meeting to-night and heard a lot of talk ❖ on a pretty old subject. Did we hear anything especially new, im- ❖ portant or worthy of wide publication? Let each recall, if he can, ❖ one or more points that may have impressed him, and we all can ❖ talk it over." ❖ ❖

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"THE SUBJECT," said the German, "was old, of course, but considering ❖ what we are learning nowadays from men like Grieves, Hartzel and ❖ others, there is scarcely any topic in dentistry more important than ❖ root-end disease. Therefore, any practical points that we can get ❖ out of a meeting like that of to-night cannot be too widely dissemi- ❖ nated. For my part, I think the essayist gave us a splendid and ❖ timely paper, and that there were a number of good suggestions, ❖ which even though not entirely novel, were rather better put than ❖ I ever heard before." ❖ ❖

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"TALK LESS AND SAY MORE," interjected the Russian. "What in ❖ your opinion was the most useful advice given by the essayist?" ❖

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"WELL, I PARTICULARLY approved of his recommendations and ❖ specimens showing how to enter root canals," replied the German. ❖ "You recall that he declares that sooner than leave the root canal ❖ improperly cleansed and filled, he would sacrifice the entire crown ❖ in order to gain suitable access to the entrance thereto. At the ❖ same time he pointed out that the more natural tooth tissue one ❖ could preserve without militating against the thoroughness of the ❖ root canal work the better for the patient. He advised that the ❖ cavity proper should, if possible, always be prepared in such a way ❖ that the axial walls should directly approach and be continuous with ❖ the walls of the root canal. Another very important point was his ❖ very forcible argument against using burs, or other cutting instru- ❖ ments, upon the floor of the cavity, since if left in its natural condi- ❖ tion there always is a funnel-shaped depression leading directly into ❖ the canal orifice. Personally I was as pleased as I was surprised by ❖ his exhibit of specimens showing cavities prepared so that perfect ac- ❖ cess to the canals was obtained, yet the cavities themselves were ex- ❖ tremely small. Much smaller, in fact, than I make them myself."

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"I AGREE WITH ALL that you have said," commented the Frenchman, ❖ but you must remember that in this, as with many other clinics out ❖ of the mouth, it was much easier to get access to all those canals, ❖ holding the tooth in your hands and twisting it as you please for

admitting light and operating your instruments, than it would be in actual practice in the mouth. Nevertheless, it was a good point to bring out, especially for the benefit of the younger men, because by showing them the minimum cavity through which it is possible to accomplish thorough root work it should render them less hasty in making radical extensions of cavities merely for personal convenience. The patient is entitled to retain as much as possible of that part of his tooth which is non-carious."

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"THAT WORD, NON-CARIOUS," said the Scotchman, "brings us to another phase of this question. All those specimens shown to-night were prepared in non-carious teeth. Working on sound teeth it is quite easy to cut ideal cavities, with walls leading directly into the canal orifices, and with a floor having funnel-shaped depressions indicating just where the orifices are. But, unfortunately, the major part of the demand for canal work occurs in carious teeth and often the caries has already obliterated these funnel-shaped land-marks on the cavity floor. Again, in older teeth, where secondary dentin has accumulated, the cavity orifices are not only very obscure, but often so attenuated that they are hard to find at all."

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"THAT REMINDS ME," said the Neutral, "of a rather good suggestion made in my hearing lately by Dr. Hyatt. He said that in such cases he swabs the floor of the cavity with a pledget of cotton saturated with iodin. Next, with clean cotton he wipes the iodin away. But usually the iodin penetrates the orifice of the canal so that after the cavity floor has been wiped clean, each canal opening shows up as a dark dot, and a fine bristle then easily enters the canal proper."

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"THAT SOUNDS LIKE a good trick," said the Russian, "and I shall certainly try it, and, by the way, Prof. Starr in the discussion to-night described another little method that sounded good to me. I have noticed that a great many essayists point out that medicaments sealed into a canal should really be sealed in if we are to get full benefit from them; and they then declare that gutta-percha does not sufficiently well seal up the cavity. But Dr. Starr to-night, I think, proposed a good scheme when he recommended filling the cavity with gutta-percha, then chilling the gutta-percha and removing it, and then dipping the cavo-surface in eucalyptus and replacing it, the eucalyptus softening the gutta-percha sufficiently so that it adheres to the cavity walls, thus making a perfect seal."

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"THAT IS ALL very well," said the Frenchman, "when the cavity is so shaped, that the gutta-percha can be easily withdrawn. But often

❖ there are undercuts, and you could not remove the gutta-percha ❖ ❖
❖ after chilling it." ❖ ❖

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"YOU OUGHT TO BE demoted to the infant class," said the German. ❖ "The withdrawal and replacing of the gutta-percha is not the important factor; it is the use of eucalyptus to cause the gutta-percha ❖ to adhere to the cavity walls that really improves the sealing quality ❖ of the filling. In a case where the filling cannot be withdrawn ❖ whole, I would think that the results could be attained by wiping ❖ the walls of the cavity with eucalyptus before introducing the gutta-❖ percha." ❖ ❖

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"DID YOU HEAR someone ask the essayist," said the Russian, "what sort ❖ of air he used for drying out his canals? Then when the eassayist ❖ replied, 'Just ordinary, everyday air,' the same man asked, 'How ❖ do you sterilize it?' I thought that was rather good myself. So ❖ much had been said about making the operation aseptic that one ❖ would hardly think it correct practice to inject 'ordinary, everyday ❖ air' into the canal, because 'ordinary, everyday air' usually contains ❖ 'ordinary, everyday bacteria.'" ❖ ❖

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"OH! FUSS AND FEATHERS!" exclaimed the Frenchman. "If ordi- ❖ nary, everyday air is good enough to be breathed into our lungs, it ❖ ought to be good enough to blow into a canal of a tooth. Besides, ❖ I think the essayist made a very good reply when he said that he ❖ used the air to dry out the canal at the moment after flooding it ❖ with alcohol, and that only enough air is used to accomplish this ❖ purpose. Thus, even if bacteria should enter the canal with the ❖ air, they would enter a sterile field in which they could not propa- ❖ gate, especially as a moment later the canal would again be closed ❖ with an antiseptic root filling, antiseptically introduced." ❖ ❖

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"THAT, OF COURSE, IS TRUE," said the Scotchman, "but why take a ❖ chance? What is the harm in sterilizing the air? Did you ever see ❖ a bacteriologist make a culture? Before dipping his platinum loop ❖ into the bacterial mass he passes his platinum loop through the ❖ Bunsen flame, thus destroying positively any bacteria that may be ❖ on the loop. In similar way I use an ordinary chip blower for dry- ❖ ing out a canal, but I squeeze the rubber bulb together and then ❖ place the nozzle of the syringe in my Bunsen flame and allow the ❖ bulb to expand slowly. The air is thus heated and sterilized at the ❖ same time. In doing this, of course, only one blast should be used ❖ in the canal before returning the nozzle to the flame. This may not ❖ be necessary, but surely it can do no harm." ❖ ❖

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"I WAS PARTICULARLY impressed," said the Neutral, "with the discussion of Dr. Van Woert. He pointed out that the mouth is usually pregnant with bacteria of many sorts, and that in using the rubber dam and rubber dam clamp, as ordinarily applied, without aseptic precautions, it is not impossible that the patient might be infected, the clamp breaking the soft tissues, and the bacteria finding entrance in this manner. At all events, I like his technique."

"WHAT WAS HIS TECHNIQUE?" asked the Frenchman. "I missed that. I was talking to my neighbor."

"I HAVE NOTICED," said the Neutral, "that when others are discussing a paper you usually are talking to your neighbor. And let me tell you something. When your mouth is open your hearing usually is impaired. Because when sound is coming out of the mouth, sound cannot enter the ears."

"QUITE SO," retorted the Frenchman. "Now let me tell you something. I have noticed that when your mouth is open sound may come out of it, but very little sense."

"QUIT QUARRELING, CHILDREN," interposed the Russian. "Let our sober spring water friend tell us Van Woert's patent process for preventing infection when applying the rubber dam."

"OH! I WOULD NOT GO SO FAR as to claim that it prevents infection," said the Neutral, entirely ignoring the Frenchman and his gibe. "Nor do I think Van Woert would. But we call ourselves dental surgeons, and it is our duty to take all the precautions against bacterial infection of the patient usually practiced by a surgeon, or which would be practiced by a real surgeon operating in our field. I understood Van Woert to say that before applying the dam he cleanses the parts about the necks of the teeth with surgical soap (an antiseptic soap) and then paints the gums with iodin. Then he uses a five per cent. carbolized vaseline for lubricating the holes in the dam itself. This certainly seems rational."

"YES, IT IS RATIONAL ENOUGH," said the Scotchman, "and I am sure I would like to feel that when I perform a root canal operation I could be assured that the whole procedure could be aseptically conducted. Yet I must confess that infection may enter through so small a gateway that I cannot but feel that it is a discouraging undertaking."

"WE ALL MUST FEEL that way at times," said the Neutral, "and for ❖ that very reason we should omit no precaution, however unimportant it may seem. I doubt very much that we can always be assured of an absolutely sterile field and a perfectly aseptic operation when dealing with root canals, but of late I have adopted a method which at least eases my mind somewhat. Aside from boiling instruments in the steam sterilizer, I also have a formaldehyd sterilizer. On one tray of this I keep all instruments used for root canal work, and when ready to operate, the tray containing the canal instruments are brought to the chair direct from the sterilizer. Here, waiter! Bring a glass of spring water all around, and we will adjourn. It is one o'clock A. M. and I am seven miles from home." (Resolution carried unanimously.) 1914.

COMMENT. The above Table Talk is just as up to date as though it ❖ were dated today. 1928.

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XI.

I WAS DINING ALONE one night recently at the **Café des Enfants,** as we call it in the higher circles of society; but as some of you may not be in our set, let me explain that the common people know the place as Child's Restaurant. I was dining there because I was dining alone. When I have campany, of course, I am compelled to eat at the Biltmore, the Ritz Carleton or the **Café des Beaux Arts;** places where the waiter does not ask: "Will you have wine, Doctor?" but pleasantly accosts you with: "Doctor, which wine will you have." So when I am eating alone, I find it economical to patronize one of the Child's (not Children's) Restaurants, where the worst that the waiter dares to say is: "Coffee, with or without milk?" Milk, mind you, not cream!

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TO GET BACK to my story, I was dining alone at Child's, or rather I was expecting to dine alone, but the Fates willed it otherwise. Did you ever approach a curb on a dark and rainy night? You naturally expect a lot of water in the drain right by the curb; so, to avoid wetting your feet, you take a long, long step, and you step completely over the dry place, and land ankle deep in a puddle? You have had the experience? Yes? I thought so. Well, that is how it was. I really passed right by the Knickerbocker, where they have a fine Grill, with good food, and where I have a favorite waiter; one, you know, who actually says "Thanks" when you give him a tip, and otherwise treats you like a Human Being, rather than just a Common Customer. As I was saying, I went right by the Knickerbocker, and went on and into Child's Restaurant, just hoping to have a quiet, lonesome little meal, with no chance of meeting any Millionaire Dentists who would insist on talking dentistry, or what they think is dentistry, when lo! And listen! What do you suppose? But let me tell you.

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I HAD JUST received my two soft boiled eggs, and after removing the outer and inner peel, I was utilizing my strong right arm to mash the edible parts sufficiently so that I could mix a little butter with the yolks and whites commingled as it were, or as they were not, but as every properly cooked soft boiled egg ought to commingle,

❖ when, without the slightest attempt at eavesdropping on my part, ❖ there floated to my ears across the fan-cooled atmosphere of that ❖ restaurant these sonorous words: ❖ ❖

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"THE TROUBLE WITH the editor of 'Items of Interest' is that he ❖ thinks he knows it all!" ❖ ❖

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NOW, HONEST! FOLKS, Cross my heart! Hope to die! That is ❖ not true. There are just oodles of things I do not know, and one ❖ thing that I do know, is that I do not know oodles of things. Now, ❖ just for instance, I do not know who made the war. But that is not ❖ such crass ignorance, because very few people do know. But be ❖ that as it may, there are also loads of things right in and about ❖ dentistry that I do not know and would be glad to know. ❖ ❖

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OF COURSE I did not want to listen to that conversation, because you ❖ know what the book says that listeners always hear about them- ❖ selves. Still, I must confess that I opened both ears and did listen. ❖ And it proceeded thuswise. ❖ ❖

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"OH! I WOULD NOT say that exactly." This from Man No. Two. ❖ "I guess he knows a few things at that." "Well I guess that you ❖ miss your guess," said Man No. One. "For instance, what does he ❖ know about mechanical dentistry? Have you seen anything about ❖ mechanical dentistry in that Around the Table stuff? Yes, you ❖ have, Not." ❖ ❖

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DON'T YOU SEE THE situation? Had hoped to dine alone, but ❖ could I do it after that! Hardly. So I took up my egg, my slice ❖ of bread, and my napkin, and moved over to the other table. You ❖ can do that at Child's, when you could not at Delmonico's without ❖ first asking the waiter's permission. But at Child's we are very ❖ Democratic, or Cosmopolitan, whichever it is. So as I say, I just ❖ moved over, and I broke right in on that conversation. ❖ ❖

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"I AM NO SHERLOCK HOLMES," said I, "but I rather opine (opine ❖ is good, what?), I say I rather opine, that you gentlemen are in- ❖ terested in mechanical dentistry. Is there any little problem therein ❖ that I might elucidate for you?" "And who might you be," asked ❖ Man No. One. "Well," said I, "I might be the Queen of the ❖ Movies, but I am not. I am merely the Editor of 'Items of In- ❖ terest.'" ❖ ❖

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DO YOU KNOW I could see right away that they suspected that I had

overheard part of their talk, and Man No. Two hastened to inter-
ject: "We meant no offense by what we said." "Offense!" said I,
"Why boys you could not offend me with a dynamite bomb. But
really I used to polish rubber plates once myself, and maybe I
could give you a point or two."

"IF YOU REALLY THINK SO," said Man No. One, "go right on where
you started. Tell us something about polishing plates; and what is
the quickest way to get the plate thin. Do you use scrapers or files
or sandpaper."

"WHY THAT IS EASY," said I. "You may not know it, but it is a fact
that I served a sort of apprenticeship with Dr. Norman W. Kingsley,
one of the greatest mechanical dentists of his day. Nowadays the
same sort of a man is a Prosthodontist, but he does not know any
more in proportion to what he ought to know than Kingsley did.
And I learned quite a few mechanical tricks from the Old Man.
For example, this very question of making a plate thin, and of
polishing it. The best way to make a plate thin, is to make it thin.
Do not make it thick and then scrape, file or sandpaper it for an hour.
If you adopt that method some day you will scrape a hole through
a plate, and then you can start right in and make it over again."

"BUT HOW DO YOU make it thin?" persisted Man No. One.

"USE THE THINNEST of wax, in waxing up. Do not be afraid to use
it too thin, because your plate will be a little thicker than your wax
in any event. So have your wax thin enough and your plate, when
vulcanized, will need no scraping. The same is true in regard to
polishing. Always polish your plate before you vulcanize it."

"BUT HOW THE deuce can you do that?" asked Man No. Two.

"SIMPLEST THING in the world," said I. "After waxing up to your
satisfaction, use a blow pipe and pass the flame rapidly over the wax.
This slightly melts the surface and when it congeals again it will
have a fairly good polish. When thoroughly cold, rub the surface
of the wax with the ball of the thumb, and it will take a fine gloss.
Then burnish tin foil over the wax and after vulcanization, and
removing the actual excess of rubber, which should have been forced
into gates cut in the plaster, you should be able to take your plate
direct to the polishing lathe without use of file or scraper.

"BUT IF THROUGH accident, or lack of care, a plate is a bit too thick,

❖ I will describe a method that was invented by Dr. J. Albert Kimball ❖ and placed on the market by him for a short time. He took some ❖ wooden mandrels, made to fit the lathe, and by revolving one in the ❖ lathe he would wrap around it, into a cone, a strip of sandpaper ❖ about an inch wide. These sandpaper cones were temporarily tied ❖ with a cord, and then removed from the mandrel and the edges ❖ smeared with glue. When the glue hardened he had cones of sand- ❖ paper which could be used on the lathe, and as the sand would ❖ wear off, a strip could be removed, exposing a fresh cutting surface. ❖ These sandpaper cones, made in different grits, were very useful in ❖ the laboratory. Some manufacturer ought to market them." ❖ ❖

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"YOU SPOKE of making the trial plate thin," said Man No. One. Don't ❖ see how you can do that and use it to take your bite?" ❖ ❖

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"I DID NOT tell you," said I, "to make your trial plate thin, nor did I ❖ tell you to use a thin wax plate for taking a bite. I told you to ❖ wax up your plate with thin wax, just before flasking. There are ❖ two ways out of your dilemma. Personally I always wax up a ❖ thin plate, and vulcanize it without any teeth on it, before ever ❖ taking the bite. In fact I use this vulcanite plate for taking the ❖ bite. One great advantage of this method is that you discover be- ❖ fore setting up your teeth, whether your impression and model were ❖ correct, and whether your plate will stay up. Remember that almost ❖ anyone can make a plate with a vacuum chamber in it that will ad- ❖ here so tightly that the patient cannot pull it down. But unfortu- ❖ nately a patient does not pull on his teeth when chewing. Quite ❖ to the contrary, he pushes on the plate. And to test a plate you ❖ should do the same. Make a trial plate by vulcanizing it without ❖ teeth, try this in the mouth, and then with the index finger press ❖ upon every part of the plate, and if it can be dislodged, it is worth- ❖ less. If it withstands such tests it will carry the teeth without dis- ❖ turbing the adhesion, provided, of course, the teeth are properly ❖ occluded. An improper occlusion will trip any plate. ❖ ❖

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"IF YOU PREFER to use a wax trial plate for taking the bite, or one ❖ made of base-plate gutta-percha, then after the teeth are set up, ❖ and the labio-buccal rim added and carved to form, this rim should ❖ be waxed fast to the cast, so that the teeth cannot be disturbed by the ❖ next step. Then with a sharp knife, slightly warmed in the Bun- ❖ sen flame, the entire palatal portion of the wax must be cut away. ❖ After this, a new palatal portion is added, using wax of the thick- ❖ ness, or a little thinner than you desire that the plate should be.

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"WHERE THE FIRST and really the best method is used, after making the plate without teeth, the teeth may be attached to this plate with wax, which may then be replaced with rubber in a second vulcanization. As the plate is to be vulcanized a second time it is as well not to over vulcanize it the first time. By this method a pretty result may be had by making the plate of black, or dark red, rubber, and attaching the teeth with pink, leaving a slight margin of the dark rubber above the pink along the rim, for protection of the pink, which is never so strong as the red or black. Of course, as you know, the pink rubber may be bleached and the color improved by placing it in a tumbler of alcohol covered with a piece of glass and setting the same in the sun for a few hours."

"CAN YOU TELL me a good way to repair a broken rubber plate," asked Man No. Two. "I have a great many full uppers come back to me broken in half, and after vulcanization they break again. Then after two or three repairs the plate not only looks like a patch-work quilt, but the rubber is as brittle as sealing wax."

"YES, I CAN GIVE you a point in repairing plates," said I, "which I am surprised is not more commonly utilized. I think that usually the two halves of the plate are waxed together, a cast poured, and then some of the vulcanite is cut away on each side of the crack, and the rest of it roughened for a short distance, after which the parts are waxed up on the cast, flasked, packed and vulcanized. By this method you will note that the wax must be cleansed away from the part of the old rubber which is to be lapped by the new, and unless this is thoroughly well done the dirty surface of the old rubber does not unite well with the new. In any event it is a poor way of making a repair because the old rubber, made thin, and then lapped by the new is never very strong. Whereas there is a method by which a plate after repair may be just as strong as a new plate."

"TELL US ABOUT IT," said both men.

"WHEN A FULL UPPER plate comes in broken in half, or nearly broken in two, the first step, of course, is to pour a cast. Next the plate should be removed from the cast and with a fine jeweler's saw the entire palatal portion should be cut away, the saw passing as near the teeth as possible. That portion which has been sawed out should then be replaced on the model, together with the parts carrying the teeth, in their proper relative positions, and again fastened together with wax. The plate should then be flasked, and when the flask is opened the palatal pieces are readily taken out and

❖ the little wax that was used easily removed with boiling water. But ❖ it is at this stage, and at a time when no more wax is needed, that ❖ a sharp clean bur is used in the engine for thoroughly cutting and ❖ dovetailing into the old rubber, which is still attached to the teeth, ❖ and right into this freshly cut surface new rubber is at once packed. ❖ Rubber dissolved in chloroform may be smeared over the surface ❖ of the old rubber, but this is not necessary. If the surface is really ❖ clean when the new rubber is packed, there will be perfect union ❖ after vulcanization. In this way an entirely new palatal portion is ❖ obtained, and solidly anchored into a thick portion of the old ❖ rubber, instead of lapping a thin joint as is commonly done." ❖ ❖

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"BUT IF THE PATIENT could break the original plate," asked Man ❖ No. Two, "why can't he break the repaired plate, even if, as you ❖ say, it is as strong as it was before?" ❖ ❖

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"THE FIRST BREAK might have been an accident that may not recur," ❖ said I. "But there are patients, who, as you say, continually break ❖ vulcanite plates through the center. If such a person cannot be per- ❖ suaded to have a gold plate, then there is still another method of ❖ overcoming the difficulty. Make a new plate as follows. After ❖ setting up the teeth with plaster, take an impression of the six front ❖ teeth, the plaster flowing over their labial surfaces, and slightly over ❖ the incisive ends. When this impression is hard, remove the teeth ❖ from the wax, and place them in the impression, of course, cleansed ❖ of all wax. Next bend a piece of iridio-platinum wire of about 16 ❖ gauge, so that it will touch the pins of all six teeth. Attach the bar ❖ to the teeth with sticky wax, remove teeth and bar together and in- ❖ vest in your favorite soldering investment. When hard heat up ❖ slowly, but thoroughly, and solder the bar to each pin. When cold ❖ you will have your six front teeth soldered to an iridio-platinum ❖ bar, and in proper relation to one another. The teeth may be re- ❖ placed on the model in proper position and when vulcanized into ❖ the plate the bar renders it almost unbreakable through the centre. ❖ A bar vulcanized in the same position, but not soldered to the teeth ❖ does not accomplish the same purpose. On the contrary, it weakens ❖ rather than strengthens the plate." ❖ ❖

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"AND NOW, BOYS, I must be going," said I. "Hereafter don't ever ❖ think that I think that I know it all, because I don't. And don't ❖ think I have told you all I know, because I haven't. I hope I shall ❖ meet you again. Good night." ❖ ❖

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AS I WAS paying my check at the cashier's desk, one of the ways they

❖ have of doing things at Child's, I heard Man No. One remark (soto
❖ voce I think it was): "I don't see that he told us so much after
❖ all!" 1915.

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COMMENT. The method of strengthening the anterior part of a vul-
❖ canite plate to avoid fracture during wear, is not to be confused
❖ with the use of a so-called "strengthening bar" placed in body of
❖ the vulcanite, most often in lower plates. Such "strengthening
❖ bars" are elements of weakness rather than strength, as they lessen
❖ the bulk of the vulcanite, and invite rather than prevent fracture.

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IN THE METHOD OUTLINED the iridio-platinum wire is soldered
❖ to the pins of the anterior teeth. This necessitates teeth which have
❖ platinum pins. 1928.

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XII.

THIS IS THE TIME of year when some folks do their "Spring Cleaning." I never hear of "spring cleaning" myself but I think of the Dear Old Lady down at Atlantic City who rents out bathing suits, and openly declares it to be her opinion that "everybody ought to take a bath once a year, whether they need it or not." However that may be, I have been doing a little "spring cleaning" in and about my desk, and I have collected several communications which have reached me during the past few months, intended for discussion, Around the Table, but which thus far have been overlooked in the talks. They are not exactly all on the same subject, but it is possible to take a number of different colored little stones and put them together so that they form a fairly good picture. So we will just glance through the letters and comment thereon.

DR. PRESTON, of Roanoke, Virginia, writes as follows: "My partner, Dr. Porter, tells me of his visit to your office recently, on which occasion he saw you use wax instead of unvulcanized rubber for pressure anesthesia. May I call your attention to another method? Prepare the cavity as usual, put in the novocain, neurocain, or cocain, coat the cavity margins with a cavity varnish and use temporary stopping. The varnish prevents slipping and leakage, and the stopping 'stays put' when pressure is applied. The cavity may be overfilled if you wish the patient to supply the pressure by biting, but cotton need not be used as would be required with the unvulcanized rubber, as the solution does not escape into the patient's mouth. I have found this method better than any other that I have tried."

I HAVE NOT TRIED this method as yet, but it sounds good, all except that about allowing the patient to bite on the temporary stopping. That would seem to indicate that no rubber dam is in place, and the Professor of Asepsis, a prominent member of the Around the Table Club, insists that no pulp operation of any sort should be attempted without the protection of the rubber dam. He says it is hard enough to perform an Aseptic operation with the dam on, but absolutely impossible to exclude infection otherwise.

THIS IS ONLY **en passant**, as we Frenchmen say, to which we may add **"revenons nous à nos moutons,"** which in New York English means getting back to the main subject, which is pressure anesthesia. When first described for pulp work the use of unvulcanized rubber was advocated, and it did have the disadvantage of permitting the escape of the fluids. But once I was in Chicago, and I informed Dr. Hart J. Goslee that I wished a pulp removed. He offered to remove it for me painlessly! Painlessly, with a capital "P." That sounded very good to me; but while I wanted the demonstration, I cannot say I was so eager about it that I kept reminding him of it every three or four minutes. In fact, it was three or four days later, and just half an hour before my train was to start, when I remarked in a casual, impersonal, absolutely disinterested sort of way, "Oh, by the way, Goslee, we have forgotten to remove that pulp of mine!" Now, that was not what one might have called strictly true. He may have forgotten about that pulp, but I should not have said "we," because I had not forgotten it for one little minute.

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VIRTUE IS ITS OWN REWARD, say some of the philosophers, and I suppose the liar reaps his own crop of regrets. At all events, you can imagine my feelings when Dr. Goslee remarked, "We have plenty of time; we will do it at once!" That gave me the first real inkling of what patients must think of us sometimes when we pass them little jests like that. But what could I do? However, why burden you with the harrowing tale. Suffice it to say that I caught my train, minus the pulp, suffered absolutely no pain, and, as they say, "went on my way rejoicing."

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THAT WAS MY FIRST introduction to pressure anesthesia using bees-wax, and I have adhered to the method ever since. Do you blame me? As I said before, I have not yet tried the temporary stopping method, and it may be superior to the wax, but one advantage of the wax is that it yields nicely under pressure, and finally the burnisher may be pressed hard enough to go through the wax, and when this can be done without pain, the anesthesia is complete.

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HERE IS AN INQUIRY all the way from Vancouver. Dr. B. S. Hanna asks: "Do you know anyone who has examined a tooth under the microscope to see the effect on a cavity soaked with nitrate of silver and then plugged with amalgam? I have often wondered if there is any union between the silver of the nitrate and the amalgam, which would prevent the recurrence of decay forever, or nearly so. I have often done this and have never had to remove a filling."

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I CANNOT ANSWER this question. To be entirely frank, I never heard the method before. Moreover, it is difficult to see what is to be gained by the use of the nitrate of silver. Usually amalgam blackens a tooth quite enough without any additional factor, though whether the nitrate of silver would cause discoloration under the circumstances is yet another question. Nitrate of silver has been used in deciduous teeth and on sensitive surface abrasions with more or less success. In the latter case the theory is that the acid mucous causing dissolution of the cementum and dentin about the neck of a tooth exposes the dentinal tubuli, so that that portion of the tooth becomes highly sensitive, and the application of a concentrated solution of nitrate of silver supplies a surface covering, which protects the part from further irritation.

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THE USE OF SILVER NITRATE, however, usually causes a discoloration which is most unpleasant, especially in the front of the mouth. For the incisors and cuspids, therefore, a preferable and equally potent method is to use a smooth burnisher in the engine and burnish the sensitive place at the neck of the tooth, using considerable pressure. The theory here is that the forceful burnishing closes the openings of the dentinal tubuli, and thus sets up a temporary barrier against the acid mucous. This, however, is of course only temporary, and it is necessary either to repeat the burnishing occasionally, or, better still, to have the patient bank about the necks of the teeth at night a paste containing a strong alkaline agent which will counteract the acid mucous.

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THERE IS NOTHING NEW under the sun, except, of course, my own ideas, and perhaps a few of yours; yet it is true that everything is new to a man the first time he thinks of it, or the first time he hears of it. Dr. Brittain, of Boston, says that the following method of repairing a broken facing on a bridge is at least new to him. Perhaps it may be to others. No harm to print the Dear Old Method once more, anyway. The old jokes are always the best jokes. Guess that is why they get old. The bad jokes die "aborning."

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"TO REPAIR FACING broken from a bridge, take a square-edged carborundum engine wheel and cut a slot in the backing. Bevel the edges on each side of this slot. Fit the backing till satisfactory and then attach pattern wax over the pins; force into the beveled slot, remove and cast gold direct to the facing. This gives a facing with a gold slab at the back, which will slide nicely to place and when cemented will be a firm attachment."

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SOMETIMES THIS is true, and sometimes it is not. Once in a while that facing will come out checked. Then, if you have no other that just matches, you can begin another hunt for another facing.

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A VARIATION of the above method is to slip two little platinum tubes over the pins before adding the pattern wax. Then when the pattern has been made the wax can be removed from the tooth and cast separately, after which it may be cemented to the facing, and that in turn cemented to the backing.

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A VOICE FROM THE OTHER END of the table cries out: "Why not make the holes in the old backing in the first place and just cement the facing to place and be done with it." Bravo! Likewise, Good Boy! It has been done successfully. If you are skilled enough to grind the new facing to place, you can either do as the Voice suggests, or as Dr. Van Woert recommended long ago. After drilling out the old pins, connect the two holes, bevel the sides mesially and distally, and then, when setting the facing, force the two pins in opposite directions and pack in a little amalgam while the cement is still soft. A facing can be replaced in this manner at a single sitting, and if well done is a permanent operation.

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DR. LOUIS H. GILBERT, of Rochester, N. Y., describes a method of cutting sensitive cavities with less pain. He says: "Up to the middle of last August I had administered nitrous-oxid and oxygen for painless operating more than a hundred times. Since then I have needed it but four times. Concluding that the major part of the pain is produced by the frictional heating up of the bur, I tried having my office girl pour a stream of cold water upon the bur while I operated, the saliva ejector drawing off the surplus water. I think also that the tooth, when chilled, conducts sensations less readily, as is demonstrated with the ether spray. I have been advised to color the water that the patient may receive the suggestion that a pain preventing agent is in use. This is probably a good idea, and no doubt suggestion plays a large part in all our work."

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THE ABOVE REMINDS ME of so many things I hardly know whether there is time to tell all of them. That is the beauty about this talking Around the Table. One idea leads to another. First, then, the scheme of having the office nurse flow water on the bur. That reminds me that I once had my teeth cleaned by Dr. Taggart. He did not use pumice, but powdered silex; and, by the way, I have used silex ever since. It is more rapid than pumice and tastes less

like "dirt," if you get my idea. Dr. Taggart would mix his silex with water, to the consistency of thick cream, and his nurse would suck this into the cut off nozzle of a chip-blower, and then drop it onto the teeth as Dr. Taggart signaled for it. Whether using engine brush, rubber cup or hand polishers, this saved time for the dentist.

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ANOTHER LITTLE METHOD of which Dr. Gilbert's proposal reminds me is accomplished with a device constructed by Dr. Van Woert. By the way, that Van Woert person has a lot of good ideas. In this particular case he has a tiny metal tube soldered to his handpiece in such a manner that the end of the tube is directed toward the bur. To the other end of the metal tube is attached a small rubber tubing leading to the compressed air outfit. When using the bur, the compressed air is turned on and a stream of cold air keeps the bur and tooth cool and the cavity clear of bur dust.

1915.

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COMMENT. Dr. Brittain's method of repairing a facing broken from a bridge, including as it does the old style metal pin tooth, by which I mean a tooth having straight pins, pins without heads to them, will appear useless to our modern young graduates, especially as nowadays we are most apt to use Steele facings, or tube teeth in bridgework. But it should be remembered that the bridge that comes in with a facing broken from it, is most likely to be an old style bridge, and the facing is broken off because it was an old style straight pin tooth, which had been soldered to the backing, the heat during the soldering probably having disintegrated the porcelain around the pins.

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SUGGESTIONS OF THIS type are useful even if the practitioner just receives a hint, from which he "originates" a new (?) method. For example, shortly after publishing Dr. Brittain's method, which I never had and never have tried, a patient came in with a beautiful fixed bridge, made by no other than Dr. Forest Orton, who as we all know is a master in this field.

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HOWEVER, EVEN MASTER BRIDGEWORKERS cannot guarantee that porcelain will not fracture, and from Brother Orton's bridge, then eight or ten years old, a bicuspid had fractured off. To make the problem worse, the backing was not straight, that is to say vertical with the gum, but was of that curved form which is said to be self-cleansing, though really no bridgework is self-cleansing; "cleansible" would express it better.

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WHAT TO DO? I thought of Dr. Brittain's method but it did not exactly apply. Yet it gave me an idea. I used a Steele facing, ground the facing and backing to fit the space in the mouth, ground a square slot in the backing on the bridge, with a groove on the gum side, the latter made with a fissure bur; packed pattern wax against the Steele backing, through the slot in the backing on the bridge, and over the entire lingual surface thereof. The facing was removed, and the wax replaced by casting a platinized gold against the Steele backing. This was cemented to place, and is still in position, proving that it is a practical repair method. 1928.

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XIII.

"HINDSIGHT IS BETTER than foresight," cried the man running away from a mad dog; but, "foresight is beter than hindsight, by a good sight," said the girl crossing a bull pasture, as she removed her red sweater.

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IT WAS ONLY A FEW YEARS ago when the dental profession of this country almost suffered mental rabies because attacked by Dr. Hunter, upon whom they looked with little less love than were he a mad dog indeed. Many truly believed that his accusation that American dentistry was Septic Dentistry, was an unwarranted diatribe against the work and workmanship of the dentists of the United States. When the truth was known, it became apparent that Dr. Hunter had used the term American dentistry, written thus: "American dentistry," and by it he meant that style of dentistry, mainly crown and bridgework, practiced by the Cheap-Johns of England and advertised to the confiding public as "American dentistry."

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THUS IN TIME the excitement in this country died down. Dr. Hunter did not mean us after all. He meant "American dentistry" with quotation marks, not American dentistry, the simon pure.

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BUT A FEW of the more scientifically inclined and more thoughtful among us, did not find comfort quite so easily, and these men have practiced "hindsight" so thoroughly, using the all seeing x-ray to obtain the insight into the results of past efforts in crown and bridgework, and this hindsight has produced such appalling pictures, such evidence of septic conditions hidden under bridgework and crownwork admittedly "Made-in-America," that it has been more than proven that American dentistry (without the quotation marks) has been sadly at fault in the not distant past.

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FROM THIS RETROSPECTION, has come introspection with the resultant verdict that in the future American dentists, at home and abroad, must use more circumspection. From this hindsight is born the need of more foresight.

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IN A RECENT PRIVATE conversation, Dr. Morris I. Schamberg was asked: "Granting that serious systemic infectious diseases are frequently accompanied by septic conditions under and around crowns and bridges, what real proof is there that the oral condition was the primary cause of the distant diseases?"

"MUCH REMAINS TO BE done to clear up this whole question," replied Dr. Schamberg, "but there is one significant fact which makes a tremendous impression upon the internist in hospital clinics. That is that, not occasionally, but frequently, serious body lesions resist every manner of treatment, and then when the oral infection is discovered and the teeth are extracted or the mouth infection cured, the systemic symptoms disappear with magic-like rapidity."

IN THE SAME general strain is a letter from Dr. T. B. Heckert, of Wayne, Neb., from which the subjoined is quoted.

"I WONDER," writes Dr. Heckert, "if you would not discuss Around the Table this question: 'Is it possible to make a really sanitary crown or bridge?'

"RECENT INVESTIGATION," he continues, "in regard to infections originating in the mouth has caused a radical change in the opinions of many honest dentists as to the value of this class of work, even though none of us doubt its usefulness as an aid to mastication and for the restoration of broken-down teeth.

"IN NEARLY ALL DISCUSSIONS that I have heard upon this all important matter, the stand has been taken that it is only poorly made crowns and bridges that are unclean, but when we examine the work of honest and skilled men, after being in use for several years, we are tempted to believe that all crowns and bridges are unclean, the main difference being that some are more unclean than others.

"I BELIEVE WE ALL have been conscientious in the past in recommending and constructing this class of work, but in the light of our present knowledge are we justified in continuing to do so?

"THE EVILS OF THE shell gold crown, so frequently used in the past to avoid a large operation, has been greatly minimized by the advent of the casting process. Now that we have the cast gold inlay, we can restore single broken-down teeth with less labor and with better results for the patient.

"BUT FOR THE BRIDGE we have no substitute except the partial plate denture, with all the problems which that brings to us in the way of clasps. On the other hand if we abandon crowns altogether, we must also dispense with the removable bridgework which relies for its retention upon some form of attachment to the abutment teeth.

"WHILE THE OLD-FASHIONED partial plate is not so serviceable for mastication as the modern bridge piece it was at least possible to keep it clean and sanitary, and we cannot detect any unholy odors from such a piece when the patient is of reasonably cleanly habits. This, of course, is, in a less degree, true of removable bridgework, but it is not true at all of fixed bridgework, and fixed bridgework being less costly, is in more demand and in more general use than removable pieces, which latter require intricate and difficult attachments, if made successfully.

"I THINK THERE IS little doubt that the increased income which crown and bridgework has brought to the dentist, has had some influence in establishing it in its present popular place in dental practice, and for this reason much outside and inside pressure may be needed to bring about its abandonment.

"IT IS CERTAINLY a sad state of affairs when a supposedly learned profession must be checked up by outside influences. We have been asking the medical profession to take more interest in dental practice, but when they do, we find ourselves under grave suspicion of having promoted those very dangerous conditions which we have so loudly condemned. Has not the time arrived for a little self-examination?"

DR. HECKERT'S LETTER is a trumpet call in clarion tones. It is a call to the crown and bridgeworkers of this country to "clean house or move out." What will their answer be? I ask what will their answer be—because they must make reply. Ever since Hunter's articles on oral sepsis, a small band of devoted men have been attacking the serious problem of root canal treatment, and already such progress has been made that a more perfect root canal technique has been established which will continue to improve until the profession will have mastered this problem, quite as well as has any surgical procedure been standardized for any other part of the body. Aye! Even more so!

THE MOST DIFFICULT part of the bridgeworker's problem therefore is approaching solution, and in this particular part of his work his

❖ duty becomes obvious. Either he must master the technics of root ❖ treatment and filling, or else he must refer that part of the treat- ❖ ment to some other man, and only start the construction of his ❖ bridge, after the root-specialist has finished making the abutment ❖ teeth free from infection and practically free from the danger of ❖ future infection. ❖ ❖

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IN THE PRESENCE of teeth affected by pyorrhea, the theory that loose ❖ teeth utilized for bridgework, will "tighten up," has been finally dis- ❖ proven. Such teeth do not regain health merely by the support ❖ rendered either by fixed, or by removable bridges. Abutment teeth ❖ should be in a state of health prior to any attempt to use them as ❖ supports for bridges. If they be diseased therefore, the disease ❖ should be eradicated before the bridge is even planned. No other ❖ course is fair to the patient. ❖ ❖

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AS IN ROOT CANAL treatment, if the bridgeworker cannot cure the ❖ pyorrhea, he should refer his patient to a specialist for treatment ❖ before undertaking any bridgework. ❖ ❖

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BRIDGEWORK OF THE FUTURE must be sane and sanitary. It is ❖ never sane to attach bridgework to diseased teeth. This, at least, is ❖ a foundation principal that may be adopted at once. The problem ❖ of making bridgework sanitary is not unsolvable, and therefore the ❖ bridgeworkers must attack this problem, and they must solve it. ❖

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GRANTING THAT bridgework should only be placed in healthy mouths ❖ and supported upon healthy teeth, there still looms up three grave ❖ aspects to the bridgeworker's problems. ❖ ❖

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BEGINNING WITH the mouth and teeth in a state of health, how ❖ shall he construct and retain a bridge without danger of inducing ❖ a diseased condition? While utilizing teeth for the retention of ❖ his piece, the bridge itself should be so constructed that while the ❖ abutment teeth shall act as efficient retainers of the bridge, the bridge ❖ itself shall support the abutment teeth against all undue or unnatural ❖ stress, while at the same time allowing the abutments that movability ❖ which is essential to maintain the pericemental attachment in a state ❖ of health. Briefly put, either too much movement of a tooth in its ❖ socket, or too much rigidity, will induce disease through trauma.

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SECONDLY, THE BRIDGEWORKER must decide whether or not to ❖ remove pulps from healthy teeth, or use them with pulps alive.

❖ Where pulps are left in abutment teeth, the problems will be, ❖ whether the inlay, Carmichael collar, or clasp will not eventually ❖ induce disease of the pulp, death of the pulp, and infection of the ❖ periapical area. Teeth thus used in bridgework, without pulp ❖ removal, belong to that great class which "never gave any trouble ❖ afterward." No! The teeth do not give any trouble; but the result- ❖ ant periapical infections, we are told, are contributing causes of ❖ arthritis and other serious systemic lesions. Hence if we leave the ❖ pulp alive, the bridgeworker must be prepared to prove by radio- ❖ graphs two, three, or five years afterward, that his living pulps have ❖ not since died, and that his non-troubling teeth are not seeping ❖ poison into his patient's system. ❖ ❖

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WHERE THE BRIDGEWORKER decides upon pulp removal, he must ❖ remember that just as soon as pulp removal is practiced, the door ❖ is opened for periapical infection. The operation therefore must ❖ be thorough, and it must be skilfully accomplished. The healthy ❖ periapical tissues must not be injured, nor infected during the ❖ process; all pulp tissue must be removed, and all of the canal or ❖ canals so thoroughly and so aseptically filled that the danger of ❖ future infection should be reduced to the minimum. ❖ ❖

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THEN TOO IT SHOULD never be forgotten that a pulpless tooth is ❖ no longer in a state of full normal health and strength. The dentin ❖ of such teeth frequently in time lose vital resistance to stress and ❖ fracture more easily. Hence in the construction of the retaining ❖ attachment, while using the tooth to hold the attachment, the at- ❖ tachment itself should be so made as to protect the abutment tooth ❖ against fracture in the future. ❖ ❖

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THE ABOVE ARE the main problems and the chief aspect of the prob- ❖ lems which confront the bridgeworkers of this country. In the very ❖ recent past we have heard little from these gentlemen save an oc- ❖ casional contribution to the purely mechanical construction of ❖ crowns and bridges. Will they now join forces, do a little research ❖ work and unite to establish a sane and sanitary system of American ❖ bridgework, which shall be free from any possible criticism by ❖ pathologists, or physiologists? ❖ ❖

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FOR THE HONOR OF AMERICAN dentistry this must be done. 1915.

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COMMENT. The above is a fair reflection of the status in regard to ❖ the problems of periapical and parietal infections, as related to

❖ bridgework, at the time when it was written. And the situation ❖ is only slighlty altered today. ❖ ❖

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HOWEVER, SOME PROGRESS has been made. The bridgeworker of ❖ to-day is more keen to have his structures safe, sane and sanitary. ❖ The advice given above has been taken by a few. I know at least ❖ two bridgeworkers of high repute who constantly send their pros- ❖ pective patients to a specialist in root canal therapy, for judgment ❖ as to the health of teeth that might be used as abutments. And it ❖ is a good plan. Consultations between dental specialists might prove ❖ just as advantageous to patients, as consultations between medical ❖ specialists. ❖ ❖

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THE SITUATION in regard to root canal treatment is improving. Prof. ❖ Blaney in his school, and Prof. Rickert in his, are doing splendid ❖ research work. Prof. Prinz also has been a valued contributor ❖ towards an advanced technique. ❖ ❖

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A WARNING IS SOUNDED in this Table Talk, that when the bridge- ❖ worker uses a vital tooth as an abutment, he should so fashion his ❖ inlay, crown or Carmichael attachment that it shall not induce dis- ❖ ease and death of the pulp. The researches of Vida Latham, Cahn ❖ and others, have shown us that death of the pulp is not always at- ❖ tributable to these particular mechanical causes, though they are ❖ undoubtedly factors. We know now that the so-called "vitality ❖ test" is a delusion and a snare. Such tests, test the nerve only, and ❖ not the pulp. Many a diseased living pulp will respond to elec- ❖ trical and other irritants. The bridgeworker therefore should be ❖ assured in advance that his living abutment tooth, is not harboring ❖ a diseased and doomed pulp. He owes this to his patient who must ❖ pay the bridgework bill; and he owes it to his own reputation to ❖ avoid such disasters as far as is possible. ❖ ❖

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YES! CONSULTATIONS between bridgeworkers and root canal ❖ specialists might be very advantageous. 1928.

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XIV.

SINCE LAST RECORDING a talk Around the Table, I have chinned ❖ with the men from China, and chatted with the fellows from Chattanooga; I have dined with Fraters in Pullman diners, and supped ❖ with superior fellows from South America. In short, I have been ❖ to the Congress in 'Frisco. Later I shall have stories to tell, but ❖ first I must be fair to those members of the Club who have written ❖ to me during my absence, and the very first letter compels me to ❖ admit that I did not have the pleasure of hearing Dr. Horace Howe, ❖ of Boston, read his paper, entitled "Importance of Mouth Hygiene ❖ During Infancy and Early Childhood." Fact is, there were ten ❖ sections and over a hundred papers. **Verbum Sap.**, as my Latin ❖ professor was wont to say when he had no better explanation. ❖ ❖

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REALLY, I AM CHAGRINED to think that I did not hear Dr. Howe's ❖ paper, because my correspondent asks me to discuss the subject. It ❖ seems that the Boston Post has had something to say, and my friend ❖ from Somerville, Mass., thinks the Post should not have the last ❖ word. On the sixth day of September the Post had this to say: ❖

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"THE STATEMENT THAT CANDY is as harmful to children as liquor ❖ is to an adult, reported to have been made by Dr. Horace L. Howe, ❖ of Boston, at the Panama Pacific Dental Congress, was yesterday ❖ declared by Boston physicans to be absurd. Contrary to its being ❖ harmful to children, the eating of candy was said to be necessary ❖ for the proper growth of the child, and that good candy has no ❖ deleterious effects whatever. ❖ ❖

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"DR. THOMAS F. HARRINGTON, medical deputy of labor and in- ❖ dustry, said that the eating of candy of good quality is as neces- ❖ sary for the sustenance of the growing child as any other form of ❖ food. 'Sugar is one of the most valuable and necessary forms of ❖ food in the development of the healthy body,' said Dr. Harrington. ❖ 'Of course, like everything else, the practice of eating candy can ❖ be abused, but eaten in moderation it can have no ill effect.' " ❖ ❖

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INTERRUPTING A MOMENT, I think the same can be said of whiskey.

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"DR. DAVID D. SCANNELL, a member of the School Committee, said that in his opinion the eating of candy is entirely beneficial to children. He added that it is not the eating of candy that causes decay of the teeth, as was charged by Dr. Howe, but rather the neglect of proper care in keeping them clean."

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MUST INTERRUPT the Post again to announce that the Forsyth Dental Infirmary will inaugurate a school for Dental Hygienists, beginning October 4th. This surely will please Dr. Scannell, of the School Committee, because it is chiefly among school children that the dental hygienist will find her work. But the Post has more to say:

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"A STATEMENT by Dr. Howe that no candy store should be allowed in the same neighborhood with a school any more than should a saloon, was declared by Dr. Francis D. Donoghue to be entirely inconsistent. 'There is a definite and tremendous danger in liquor, and to attribute a like danger to candy is absurd. Candy is the least of the sources of danger to children. From a physiological viewpoint, candy, or some other form of sugar, is absolutely necessary to the welfare of the child.'"

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VERY TRUE, AND VERY LIKELY if all candy were all sugar, and if candy were administered to the child in physiological doses, the results might be entirely physiological. It is quite true that the child must have his **quantum suf.** of sugar, but as he gets sugar in tea, in coffee, on cereals in the morning, and in pies and puddings after dinner, not to mention the jam on his biscuit at night, is it not just possible that candy, if restricted even to purest sugar, which it seldom is, might provide the youngster with more saccharin material than is physiologically required?

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HOWEVER, IT IS NOT my purpose to reply to the learned M.D's. from the Hub, but rather to invite others better informed than I to do so. Still, I may repeat an old epigram, which must have at least a grain of sense in it, else it could not have lived to such a respectable old age.

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THE EPIGRAM READS THUS: "When there is a liquor saloon on one corner, and a candy store in the middle of the block, it is quite natural to find a drug store at the other corner."

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DR. FREDERICK J. SHADDOCK, of Rochester, writes as follows: "In the August issue Dr. L. H. Gilbert describes a method of cutting sensitive cavities with less pain, saying: 'The major part of the pain is produced by the frictional heating up of the bur'; and his method is to play a stream of cold water upon the bur while operating, the saliva ejector drawing off the surplus. Yes! Good! But there is a little more scientific way. My preceptor, Dr. R. H. Hofheinz, lectured to me twelve years ago in college regarding bur heat, and declared that sharp burs produce less heat than dull ones. Also that by occasionally dipping the bur in carbolic acid, and then using it in the cavity, we have the bur lubricated to the extent of preventing much friction, surely less than when using water, carbolic acid being an oleum. Moreover, the protoplasmic contents of the tubuli which conduct the pain being coagulated by the carbolic acid, we reduce the sensitiveness to the minimum, have our field of operation constantly sterile, the infected area well disclosed by the carbolic acid, and all the time be freer in our work than if using a spray, causing water to splash all around."

ON THE SAME SUBJECT, Dr. Frank Bliven, of Worcester, Mass., contributes the following comments for the delectation of the fellows Around the Table: "After reading Dr. Gilbert's method of using a stream of cold water upon the bur, I think that would be a very unsafe place to use it, for I am confident if it was put into the cavity of some of my patients the landlord would have to repair the roof; besides I see no necessity for keeping the bur cool. A sharp bur at high revolution, and the impact no harder than is necessary to cut and clear will prevent the bur from heating. To the best of my knowledge I am the first man in this country to run a dental engine by electricity successfully, and have used as high as 7,500 revolutions a minute, and, as the saying goes, 'The higher the fewer.' For excavating sensitive dentin I found this to be a very practical degree of speed, but pretty hard upon the handpiece and difficult to obtain in the motors manufactured to-day. I had mine wound especially for 5,000 revolutions, which is considerably higher than those generally in use. I find there are a few men who appreciate the value of high speed and trust these words will quicken a few others to experiment with it for the benefit of the suffering public." 1915.

COMMENT. Since the above was first published Dr. Evangeline Jordon has published her splendid work "Operative Dentistry for Children," and by the way it was at this same San Francisco Congress that I first had the pleasure of meeting Dr. Jordon. She has

❖ solved the problem of candy for children by giving them dried
❖ fruits, such as dates, figs, prunes, raisins, etc., etc. A prune soaked
❖ in water over night will swell into a most delectable "sweet" for
❖ children. 1928.

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XV.

THERE ARE A FEW communications from those interested in this department which we must consider this month, one of which is from Dr. E. F. Izin, who is apparently eager to break a lance in defense of Dr. Howe, and against the Boston Doctors who declare that children may eat candy. Dr. Izin writes as follows:

"TO STATE THAT SUGAR in the form of candy is necessary for the sustenance of the growing child is almost the most preposterous statement of modern times. Dr. Roessler a few years ago disposed of this matter in a very able article on the subject of sugar and candy. I maintain, and refuse to recede from the position, that natural fruits and vegetables furnish all the saccharin required by anyone. Whoever heard of an individual being deficient in sugar? The candy habit of to-day is one of the most harmful practices of the twentieth century. I have little doubt that Dr. Howe voices my own views, though I have not had the pleasure of reading his paper."

NOW THEN, FRIENDS, if you must buy some candy, get ten cents' worth and eat it yourself. But do not give any to the kiddies!

THE FOLLOWING reads like a very practical suggestion, made by Dr. R. L. Graber, of Peoria, Illinois. This is a method of replacing a facing broken from a crown or fixed bridge:

"SELECT A FACING of proper size and color. From very thin copper make a backing to fit the facing. This is merely to be used as a pattern, and we shall call it pattern number one. Next make a similar pattern of the space where the facing is to be replaced. Call this pattern number two. Place pattern number one over pattern number two and punch pin holes in number two, as indicated by number one. Place pattern number two (which now has pin holes in proper position), in space where facing has been lost, and using it as a guide drill pin holes through the backing left on tooth, or bridge, as the case may be. Now place pattern number two on new facing and grind facing to conform with the pattern. Set facing in place and grind pins flush with the lingual surface of crown

or bridge. Remove facing, thread the pins, and then with a large round bur countersink the holes on the lingual side. Set facing with cement and fill around pins with amalgam, and smile while you do it. The entire operation should be done in twenty minutes, and done well."

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NOW THAT WE ARE all insisting upon restoring occlusal form when filling teeth, either with gold inlays or with amalgam, the following very ingenious method, suggested by Dr. J. F. Mayer, of Philadelphia, will be found interesting. He writes as follows:

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"THIS METHOD IS APPLICABLE only to teeth in which the entire masticating surface is to be restored. I use the die forms intended for striking up occlusal cusps for gold shell crowns, and I strike up a large variety of cusps, using 36 gauge copper. The cavity of the tooth having been prepared, I select a copper cusp of approximately correct size and form and place it upon the tooth to be filled, burnishing the margins of the copper cusps, close against the natural tooth, so that it may not be dislodged when the patient bites upon it. I then have the patient bring the jaws together and bite upon the copper cusp, which is soft enough to yield under this stress, and thus is produced an accurate occlusion. The copper cusp is then inverted and thin tin foil burnished against the inner side, after which it is filled flush with amalgam. It is preferable to use one of the quick-setting types of amalgam, which is soft for a minute or two. The cavity is then quickly filled with the same material and the copper cusp placed in position on the tooth so that the two amalgams come together and unite under pressure, which is best insured by having the patient close the jaws again. The mouth should be kept shut until the amalgam has begun to set, when the copper cusp can be lifted off and any excess removed. The result will give good reproduction of natural teeth and the occlusion will be accurate."

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IT WOULD SEEM that better results might be obtained by using natural teeth as dies with which to stamp up the copper cusp matrices. The teeth could be embedded in plaster so that only the morsal third would be exposed, and a low fusing metal counter could be made by using a ring and pouring the metal over them. The cusp matrices could then be swaged into these counter dies by any of the usual methods. It must be said, however, that the specimen filled tooth sent in by Dr. Mayer is very pretty, and proves that the method can be made useful.

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HERE IS A PRETTY old letter, but now that the war makes it difficult to get so many things, we may run out of separating silk, and the suggestions herein contained may help some one. In the Items of Interest for January, 1913, Dr. Van Woert described and illustrated a method of separating teeth with silk. He received the following letter from Dr. Edward L. Wharton, of Newark. After a few preliminary remarks he says: "I think you will be interested in the use of ordinary sewing tape for separating teeth. It has all the advantages of the ligature silk of which you speak, and which I used before using this tape, and to my mind the following additional advantages: The entire operation can be done by the patient, thereby taking none of the dentist's time. Any amount of separation can be gained, and if the cavity extends beneath the gum it will force the gum back so as to expose the entire cavity, by the simple expedient of using wider tape. The method is as follows: If the appointment for the actual work is to be on Wednesday, I ask the patient to put a piece of tape between the teeth on Monday night and cut it close to the teeth both front and back. Tuesday morning put in two thickenesses; Tuesday night three, and Wednesday morning four. Unless the teeth are very close together the patient can do this easily. If they are too tight together I use the immediate separator and put in the first tape myself."

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THIS METHOD IS VERY OLD, of course. Probably much older than Dr.Wharton. Yet in some respects it is a good method. Dr. Wharton's letter is printed, however, because besides the good method which he describes, it suggests certain comments which may be helpful. For example, he tells us that with tape of sufficient width gum tissue may be pressed away from the gingiva. Let it not be forgotten that the major part of all pain produced whilst separating teeth is due to pressure against the gum. The one prime advantage in the ligature silk method is that as it contracts around the contact point it likewise draws away from the gum, and that is the secret of its painlessness. If one must force gum tissue away, there is the old reliable method of packing the cavity with cotton saturated with sandarac varnish. A cleaner and just as effective method is to pack the cotton and sandarac between the teeth and tight against the gum and then fill the cavity proper with base plate gutta-percha. If possible, leave this for a week, or even longer.

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TO FORCE GUM AWAY from the margins of labial or buccal cavities use gutta-percha. Where the cavity is shallow, a ligature silk should be tied around the tooth and over the gutta-percha while the latter is still plastic. With a warm burnisher then pack the gutta-percha

❖ tight. In two days the gum will have moved away so that an im-
❖ pression of the cavity can be taken which will show the gingival
❖ margin clearly defined. The cavity should be repacked between
❖ sittings if an inlay is to be made. At the second sitting, frequently,
❖ the rubber dam can be used. In the anterior teeth, if a cervical
❖ clamp cannot be placed, the dam can be kept above the cervical
❖ border by using a part of a small steel pin, and tapping it gently,
❖ directly into the dentin at the tooth neck and above the cavity
❖ border. ❖ ❖

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REVERTING TO THE MATTER of separating teeth, it is precisely
❖ where teeth are very tight together that the ligature silk surpasses
❖ tape. There is almost no condition in which ligature silk cannot
❖ be used, whereas many places, notably between molars, cannot be
❖ treated with the tape at all. The tape, however, is often preferable
❖ in the front of the mouth, though it would seem best for the dentist
❖ to place at least the first piece himself. Some years ago Dr. C.
❖ Frank Bliven, of Worcester, introduced a tape coated with gutta-
❖ percha. This was much more efficacious and more cleanly than
❖ the tape alone. Out Chicago way they steep the tape in white wax,
❖ and they say "it beats all." But you know how those Chicago fel-
❖ lows talk! 1915.

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XVI.

VERILY I HAVE BEEN DOWN among the Philistines! "What is a Philistine?" Wonder if I have used the word advisedly! I just happened to think of it, and used it, and like a flash you are back at me with "What is a Philistine?" So let us look it up and see if there really are any, and if I have actually broken bread with them. Let us see what the Standard Dictionary says. Here it is:

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FIRST DEFINITION: "Philistine: A civilized and warlike race, supposed to have come from either Crete or Egypt, that disputed the possession of southwestern Canaan with the Israelites for several centuries." Second definition: "A blind adherent to conventional ideas; an ignorant and narrow-minded person, especially one given to money making; one devoid of culture, or indifferent to art."

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HAVE WE ANY PHILISTINES in dentistry?

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SUPPOSE WE REVISE the dictionary definition and see if we can fit it to the present situation. Let us say that the Philistine in dentistry is, "A blind adherent to conventional ideas; not really an ignorant man, but nevertheless narrow-minded; one who is indifferent to art, but by no means indifferent to money-making; a graduate dentist whose graduation was important only as a step toward a license to practice, and whose license and the privilege of practicing is more valued by him than his diploma and the knowledge, of which it should be a certificate, and which should enable him to benefit others in the world."

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HAVE WE ANY PHILISTINES in dentistry?

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I HAVE OFTEN WONDERED, and was wondering when I received the following: "Suppose you leave your Pullman Cars, your Palatial Hotel Dining-rooms, and your Gilded Grills where you sit Around the Tables in evening clothes, and spend your evenings chatting with the millionaire dentists in the eventide of successful practice among the Idle Rich. Suppose you abandon your limousine, don your workaday clothes and take a subway train down to the realm where

❖ the young dentist is trying to make money out of dentistry, because ❖ he has to pay interest on the money he borrowed to buy his way ❖ through college; and because his landlord asks for the rent in ad- ❖ vance, on the first, at noon sharp; and because last month the wife ❖ gave birth to twins, and mother-in-law is stopping along for a month ❖ or two, to 'help out!' Suppose, Mr. Philanthropist, Mr. Idealist, you ❖ come out of the clouds, step down to earth, leave your own world ❖ for a night, and dine with us down here to get an inkling of 'how ❖ the other half lives?' Come, sit Around the Table with us once. ❖ The place, Little Hungary! The date, to suit yourself! The time, ❖ about 10 P. M., after we close up for the 'day.' Will you come? ❖

(Signed) "One of the Philistines." ❖ ❖

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THAT IS HOW IT CHANCED that I went down to Little Hungary. ❖ Note that I say I went "down" to Little Hungary. I say "down" ❖ because, like almost every other business, Little Hungary now has ❖ a Broadway Branch up among the bright-lights, northward of Forty- ❖ second Street. Forty-second Street, be it known, is as much a ❖ standard of direction as the meridian at Greenwich, which latter, ❖ by the way, I have visited and did not find nearly so attractive as ❖ Forty-second Street and the territory one-sixtieth of one degree north ❖ and south thereof. ❖ ❖

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SO IT WAS TO THE ORIGINAL Little Hungary, down in Houston ❖ Street, that I went. This Little Hungary is a famous little restaurant, ❖ from which visitors come away very little hungry, and even less ❖ thirsty, since there is abundance of food of good quality, and wine ❖ in liberal quantity, which you obtain by the simple expedient of ❖ holding the glass under an inverted bottle and pressing upward ❖ against the movable glass stopper. ❖ ❖

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IT WAS IN THIS ENVIRONMENT and atmosphere that I met the ❖ Philistines, and while I think that I knew them and their problems ❖ and troubles better than they thought I did, yet let me say that I ❖ am glad indeed that I went, and I hope they are glad also that I ❖ came. But you want to hear what they said to me, and what reply ❖ I made. ❖ ❖

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THE SPOKESMAN, and I may say the Chief Philistine, when the coffee ❖ was served, arose and spoke somewhat as follows: ❖ ❖

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"WE HAVE INVITED YOU amongst us because we have been read- ❖ ing your Around the Table talks, some of which have been valuable,

❖ some amusing, and not a few impracticable, at least from our stand-
❖ point. Our profession is advancing so rapidly that one must be a
❖ hustler to keep pace with the demands. How can the mass keep
❖ step and be near enough up toward the front to hear the music
❖ of the band, and so be in sight of the leaders? ❖ ❖

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"THE PROFESSION is composed of two groups of practitioners. By
❖ far the smaller group is made up of those fortunate enough to be
❖ able to collect five dollars or more for each sitting of treatment and
❖ filling of a root canal. But a group who can collect only a five-
❖ dollar fee for all the treatment and root work, added to the filling
❖ of the tooth itself, is vastly larger. Can good work be done
❖ for such a fee? Question number one for you to answer later. ❖

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"DO DENTISTS of any group, and working for any fee, maintain fully
❖ equipped dental offices? I am not alluding to sanitary conditions,
❖ because I doubt if there is an aseptic dental office, or operating
❖ room in this city. Nor do I believe there ever will be under present
❖ conditions. If we wish to conduct our professional work in an
❖ ideal manner we shall require buildings specially constructed for
❖ the purpose, equipped with every known appliance, or accessory,
❖ that a progressive science would consider essential. Call these build-
❖ ings Clinics, Dental Hospitals, or what you please, but there should
❖ be such a structure near every school, managed by competent den-
❖ tists paid by the State, or municipality. Question two, 'Do you ap-
❖ prove of this idea?' ❖ ❖

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"IF WE MIGHT HAVE SUCH institutions, competent specialists could
❖ practice each of the many branches into which dentistry is so rapidly
❖ dividing, and we would have places for the best of our young grad-
❖ uates to learn in the hard school of practice what they have been
❖ taught so poorly in the harder schools of theory. At present do
❖ you believe that our graduates are safe to let loose on our people,
❖ especially now that we are told that to practice on the teeth is to
❖ tamper with the health of the patient? Do you think that our
❖ Examining Boards really safeguard the interests of the people? Do
❖ you think any Board in this country competently determines the
❖ sum of knowledge and skill that these young graduates possess?
❖ The State demands that a dentist must have a license. If the State
❖ then gives the license, should not the Citizen feel that it is safe to
❖ entrust his teeth into the care of this man to whom the State has
❖ granted a license? Is the Citizen safe to do this? Would you do
❖ it? Would you walk blindly into the office of any dentist who has
❖ a license from this State, framed and hanging on his wall, and

❖ permit him to use his own judgment in caring for your teeth?
❖ Answer! ❖ ❖

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"I COULD GO ON and show you how wrong we all are. How we have
❖ been and still are groping in the dark. But I believe you know this.
❖ Change cannot be effected in a night, nor in a season, but is it not
❖ your duty as an Editor, is it not the duty of the Societies, Local,
❖ State and National, to realize this ideal and to work for its attain-
❖ ment? Above all, since we benighted Philistines must do our work
❖ for and among the poor, by our very incompetency spreading
❖ systemic diseases, as you uptown men accuse; and since these dis-
❖ eases, starting among the poor, may spread even to the rich, the
❖ identical rich who pay you the fees that make it possible for the
❖ best of you to do ideal dentistry; in the light of all these truths I
❖ say to you, the leaders, is it not your duty, your duty to your own
❖ rich clients, your duty to our poor patients, your duty to us, the
❖ Philistines, to charitably open your Society's gates, to cast off your
❖ 'holier than thou' robes, to receive us as brothers within your fold,
❖ and so to help us to do better and to be better? I ask you these
❖ questions. Answer!" ❖ ❖

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NOW I THINK YOU WILL agree with me that when gentlemen invite
❖ you out to dinner, even though they be Philistines, if they ask you
❖ questions like that, you are bound to answer; if you can! So I
❖ was obliged at least to say something. And this is what I said: ❖

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"IT SEEMS TO ME THAT I have been brought among you under false
❖ pretences. Your invitation, signed, 'One of the Philistines,' scarcely
❖ prepared me for the speech which I have heard. I will respond to
❖ your questions, but first let me reply to the letter of invitation. In
❖ it you call yourselves Philistines! You, not I. You tell me that
❖ our talks Around the Table are impracticable down here, where the
❖ young man must make money out of dentistry because the landlord
❖ wants his rent, and because the wife has twins, and you dare me to
❖ come down and see 'how the other half lives.' ❖ ❖

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"NOW, MY FRIENDS, are you quite sure that you yourselves know 'how
❖ the other half lives?' The half against whom you decry because they
❖ change their clothes at night, and because sometimes they ride in a
❖ taxi? Did it ever occur to you that the men uptown with millionaire
❖ clients did not begin practice among the rich? Would you believe
❖ that some of them started in humble dental offices, as apprentices,
❖ on 'nothing a week, and pay for what you break or spoil?' Do you
❖ realize that the respected old practitioners were once young grad-

❖ uates themselves, and that perhaps they remember quite keenly the
❖ time when they subsisted for a whole week on a package of Hecker's
❖ Self-Raising Flour, made into cakes with their own hands, and
❖ washed down with warmed-over coffee contributed by the kindly
❖ cook in the boarding-house where their home, and therefore their
❖ castle, was on the top floor center, and lighted and ventilated by a
❖ skylight? Or that memory might bring back as a dim picture, to
❖ one at least, the period when for a week's work as dental assistant
❖ the pay was twelve dollars, with two dollars extra for half a day on
❖ Sunday, and when living in a sumptuous fifth floor back (no ele-
❖ vator) how this man realized that he was quite comfortably well off,
❖ through discovering that a less wealthy neighbor was cooking her
❖ own meal over his gas jet, said meal consisting of two potatoes boiled
❖ in a hand-held saucepan! ❖ ❖

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"MY GOOD PHILISTINES, I FEAR that some of you forget that many
❖ of the men uptown started life downtown; that many of the rich
❖ know all about the trials of being poor; that many a successful
❖ dentist receiving ten dollars an hour feels that he earns every cent
❖ of it, because when he was only able to receive one-tenth of that
❖ sum for the same time, nevertheless he did his work with the same
❖ conscientious endeavor as now, when he is obtaining full fees. ❖

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"HAS IT EVER OCCURRED TO YOU, My Philistine Friends, that you
❖ who find it difficult to pay the landlord on the first, at noon sharp,
❖ and to feed your wife's twins (and her mother) have made two
❖ great mistakes? First, you should not have studied dentistry; and
❖ second, you certainly should not have married and risked the com-
❖ plication of twins. In other words, too many rush into dentistry
❖ thinking it will be a nice, easy, respectable method of making money.
❖ Too few enter the profession, as a minister takes up his calling, with
❖ the hope of doing some good in the world. ❖ ❖

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"YES! I HEARD THAT ASIDE! 'Tommy rot' one of you calls such
❖ sentiments. Yet there are men who have lived for years on less than
❖ any of you now have, and who have stuck to dentistry for the love
❖ of dentistry, and who have remained single for years because they
❖ could not support a wife and twins; men who have been content to
❖ struggle on, paid and amply repaid by relieving suffering and serv-
❖ ing their fellowmen. And, curously enough, it is men like these, and
❖ I could name you a dozen, who to-day are the very ones who earn
❖ the big fees, ride in limousines, and are surrounded by large and
❖ loving families. Can you begrudge them their success? ❖ ❖

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"BUT YOUR CHIEF PHILISTINE, who to my mind is no Philistine at all, asked me a few questions. Question number one is the dear old familiar query, 'How can a man do correct root canal work when the fee for filling canal and crown is only five dollars?' There is but one answer. The license which you have from the State permits you to practice dentistry, but it does not compel you to practice dentistry. If you cannot earn an honest living doing honest dentistry, then take up carpentering, be a butcher, sell cigars, or sweep the streets; but give up dentistry. To extract a tooth which some other man might have the skill to save, is perhaps a disgrace, but to incorrectly fill root canals with the knowledge we now have of the possible consequences is a crime. Extraction will harm your patient less than half-filled root canals. It is no longer then a question of fee, but a question of duty. Because the patient is poor does not excuse any man for inoculating him with the virus of disease.

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"QUESTION NUMBER TWO. YOU ASK whether I would approve of dental hospitals attached to all our schools, equipped and run at the expense of the municipality. Certainly! It must come to that; it is coming to that. All cities at present build and manage hospitals for the poor. This because it is a recognized part of political economy to keep our working units in a state of health. Now that the medical world is coming to see that the mouth is the portal through which enter those very diseases that make the hospitals necessary, the day will dawn when communities will find it cheaper and more profitable to prevent disease in dental hospitals, rather than to treat disease in regular hospitals.

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"DO I THINK THAT our Examining Boards are competent to determine the real ability of young graduates? I cannot say that the Boards cannot test out the young graduate, but I am reasonably sure that they do not do so. Here again is a flaw in the system. Most Examining Board members are elected by their society and appointed by the Governor. But they are selected by their friends who are in political control, and they are not selected because they are specially fitted for the job, but rather because they specially want the job. It is of course true that many examiners, after several years of service, become capable examiners. Nevertheless, the entire system is wrong. If this is a State affair at all, and certainly it should be the State's affair to safeguard the health of its citizens, then the men who act as examiners should first have their own fitness tested by examination; and secondly, they should be paid for their services, for certainly if dutifully done this is a duty well done. And the

❖ servant should be worthy of his hire, especially a servant of the
❖ State entrusted with safeguarding health. ❖ ❖

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"AND AGAIN, MY IDEALISTIC PHILISTINE, you and I agree to-
❖ gether. It certainly is the duty of the dental editors to realize the
❖ ideal and to struggle for it. And it is the duty of the Society to
❖ take in the lowliest and give him a place near the pulpit where he
❖ can hear the preaching and be bettered. But look also into your
❖ own hearts and remember this: The young graduate has only just
❖ passed through his commencement. He should continue to study.
❖ Now, study needs both eyes, yet some men hold a silver dollar so
❖ close to their eyes that for them all else in the world is blotted out.
❖ Moral: Don't be a Philistine. ❖ ❖

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"NOW THAT WE ARE STARTING a New Year with new resolu-
❖ tions, how would this serve as a new code of conduct: 'My neighbor
❖ first!'" 1916.

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COMMENT. The above was published January 1916. The majority
❖ of the "Philistines" whom I met that evening, have moved from
❖ the lower East side to the upper West side, which is much the
❖ same as saying, from the tenement house district to the region of
❖ palatial apartment houses. All of them now do root canal work,
❖ using x-ray equipment of their own. Some clinic on this subject,
❖ and some specialize in it. ❖ ❖

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EVERY PHILISTINE present that evening is now a member of his Dis-
❖ trict Society, and therefore a member of the State and National
❖ Associations. Thus the Society Gates have been opened, even as
❖ the Chief Philistine prayed. ❖ ❖

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THUS WE SEE that the World Do Move. Philistia has now overlapped
❖ and occupied Belgravia. 1928.

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XVII.

WELL, I HAVE BEEN TO BALTIMORE. In July I hope to attend meetings in Pittsburgh and Louisville. After that there will remain only two large cities in the United States that I have not visited; New Orleans, to which I have frequently been asked by Brother Kells, and Cincinnati, to which I expect to be invited as soon as Brother Callahan thinks of it.

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AS I WAS STARTING for Baltimore, a friend said to me: "Be sure to get some of the wonderful Baltimore oysters, and if any of your friends give you any oysters, be sure to praise them. Outside of their beautiful women, there is nothing Baltimore brags about so much as her oysters, unless perhaps it may be terrapin and canvas-back duck." So you see I was prepared and knew what to expect. Nevertheless, I certainly was astonished when we went in to dinner and saw five oysters on a plate, staring me in the face as it were. How shall I describe them? Perhaps I can't do better than to say that after a fellow has eaten five such oysters he has eaten a five-course dinner.

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SO I TURNED TO Brother Holly Smith, who sat at my right, and remarked: "These are wonderful oysters. What do you call them down here?" And he replied: "They are Lynhavens, I think, but they come from Providence, Rhode Island." Isn't it always that way? Once I smuggled some Canadian enamel jewelry across the bridge at Niagara Falls, and later I found there was no duty on them anyhow, because they were made in Newark, New Jersey.

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I SEE NOW THAT I should not have started to talk about Baltimore, because one never knows where to stop when on that fascinating topic. I could tell you, for example, that it is called the "Monument City," because they built the first monument to Washington. And the "College City," because they started the first Dental College, and the "City of Beautiful Women," because—but just go there and have a peep.

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THE BALTIMORE BEAUTY does not come from Providence, Rhode Island; neither is she made in Newark, New Jersey.

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WHAT I REALLY HAD in mind to tell you about was a little table talk I had at the Rennert. I was about to say in the grill room, but I think it was really the main dining-room. I just thought it was the grill room because I was thoroughly grilled. You see, I had gone to Baltimore to give a little talk on a somewhat new subject, to wit, the filling of root canals. After the meeting, one of those hospitable Southerners kindly took me back to my hotel and then suggested that we "sit down and have an oyster." After the five I had at dinner, I was not tempted. But I saw the man had something on his mind, and I expressed a willingness to sit and talk. Really, I thought he was going to ask me something like this: "Honest, now, just between friends, do you often fill root canals like the pictures you showed to-night, or are those just the few best, culled out of a mass of failures?" I was really ready for that question, because Brother Buckley asked me that out in Chicago right before forty other men, and I have had seven months to think of the answer. But my Baltimore friend surprised me.

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"A FEW MONTHS AGO," said he, "you printed an article in your magazine entitled 'The Filling of Root Canals That Cannot Be Filled.' Now I would like to have you tell me how to 'retain inlays that cannot be retained?' "

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"SOUNDS LIKE A GOOD PROBLEM," said I. "Suppose you describe the sort of cavity you have in mind."

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"I WILL START," said he, "with a condition that occurs very frequently. Of course, I practice the Black system of cavity preparation, cutting wide for prevention and using the step formation for retention. Let use suppose a cavity in the approximal surface of a bicuspid or a molar. I extend into the occlusal surface, forming my step with a flat seat, and carrying the cavity completely across the occlusal surface to the end of the sulcus near the opposite marginal ridge. But suppose that a year or two later the patient returns with a cavity in the other approximal surface. Then I am in a dilemma. Should I remove the inlay that I placed two years ago? That does not appeal to me. First it is almost an admission to my patient that my first work was a failure, or at least a useless expense; and secondly, if I do, then I must make a so-called M. O. D. filling which so many experts say cannot be successfully made. If, on the other hand, I

❖ only extend my approximal cavity slightly into the occlusal surface,
❖ I have the embarrassment of having my patient shortly after bring
❖ my inlay back to me in her hand, with the sententious remark, 'Is
❖ this one of your inlays, Doctor?' Now what am I to do in cavities
❖ like that?" ❖ ❖

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"OF COURSE," said I, "I cannot tell you the best way; I can only tell
❖ you what I do myself. I fill the first cavity just as you have de-
❖ scribed, but when the patient returns with decay in the opposite
❖ approximal surface, the routine differs slightly in bicuspids and
❖ molars, for which reason I shall describe them separately. ❖ ❖

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"SOME FEW YEARS AGO," I continued, "we published a series of
❖ articles by Dr. Conzett, illustrated with cuts, showing his ideas on
❖ cavity preparation for inlays. Speaking of M. O. D. cavities in mo-
❖ lars (see 'Dental Items of Interest,' March, 1911), he recommended
❖ making the inlay in two parts, one interlocking with the other. This
❖ method did not appeal to me, because I do not have any difficulty
❖ in making M. O. D. inlays that fit. At least I do not think I have
❖ any difficulty. (As the villain in the play would remark in a loud
❖ aside, 'Ha! Ha!!' and likewise, 'More anon!') I therefore do not
❖ make my M. O. D. inlays in two pieces, but I did adopt the idea
❖ in such cases as you have described. Thus, having placed a large
❖ inlay in a molar, including the mesial approximal surface and passing
❖ completely across the occlusal, when I must later treat the distal
❖ approximal, I bring the cavity up into the occusal surface and then
❖ cut a step into the already set inlay, if possible making this step ex-
❖ tension slightly wedge-shaped, so that when the second inlay is set
❖ this dovetail extension into the old inlay produces what we may call
❖ reciprocal retention. ❖ ❖

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"MOREOVER, WHEN MAKING the first inlay I always have this
❖ future possibility in mind, and therefore I cut the occlusal step
❖ as wide as may be consistent with safeguarding the standing walls,
❖ thus providing width enough for making the dovetail extension for
❖ inlay number two without really interfering at all with the original
❖ contact of the first inlay with the side walls. ❖ ❖

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"IT IS IN THIS particular feature that the bicuspid preparation differs
❖ from the molar cavity form. In the bicuspid, when cutting the
❖ occlusal extension step I also make it as wide as would be consistent
❖ with safety, but it is not possible to make it wide enough to receive
❖ a dovetail extension from a possible second inlay. When the second
❖ inlay therefore must be made, the occlusal extension step is cut

❖ by passing a narrow fissure bur along one margin of the occlusal ❖ portion of the previous inlay. The extension for retention in bi- ❖ cuspids, therefore, is really an extension, one margin of which rests ❖ against the cavity wall, while the other margin rests against the ❖ remains of the original occlusal extension of the first inlay. ❖ ❖

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"TO COMPARE THE TWO METHODS more directly, in the molars ❖ the dovetail occlusal extension lies wholly within a slot cut into the ❖ original inlay; while in the bicuspids, the similar slot is made by ❖ cutting away one-half of the occlusal extension of the original inlay, ❖ so that one margin of the slot is gold and the other is the wall of ❖ the cavity. Further, we might say that the molar extension is a ❖ full dovetail, while the bicuspid extension is just a half dovetail, ❖ being straight along one margin and flaring outwardly on the other. ❖ In both instances the inlays are reciprocally retentive." ❖ ❖

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"I WILL TRY THAT," said the Baltimorean. "But let me give you an- ❖ other one. What shall we do with bicuspids and molars with only ❖ one wall standing? Of course, I approve of the step system of ❖ cavity preparation, but I do find such cavities much more easily cut ❖ in celluloid teeth than in the teeth of living, human beings. Down ❖ here in Baltimore, teeth seem to have the perverse habit of decay- ❖ ing away just where the occlusal step ought to be, or, worse yet, of ❖ fracturing off one entire wall, leaving the other in such shape that ❖ the step system is impossible." ❖ ❖

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"I HAVE OFTEN WONDERED," said I, "why the expert teachers of ❖ cavity formation have never described their treatment of such ❖ cavities. The method which I have been following may not appeal ❖ to you as sound, but up to date I have never to my own knowledge ❖ had an inlay come out when I shaped the cavity as I shall describe, ❖ nor have I had the standing wall fracture." ❖ ❖

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"THAT WILL BE GOOD ENOUGH for me," said my inquisitor, ❖ "whether the method be scientific or not." ❖ ❖

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"WELL, THEN, suppose we consider the bicuspid first, and let us imagine ❖ that the mesial half of the tooth is still intact. I select this because ❖ here we must have as little display of gold as possible. Of course, ❖ if the tooth is pulpless the inlay may be seated deeply in the pulp ❖ chamber. But this alone will not retain the inlay; and, by the way, ❖ a pin is useless. In fact, I have never used a pin for retaining any ❖ sort of inlay, as I think the pin will more often prove an element ❖ of weakness than a factor of strength. Where the pulp is still

alive and it seems advisable to save it, the gingival seat should first be made perfectly flat, by which I mean at right angles to the pulpal wall. This is best accomplished with the bur now obtainable, shaped like a fissure bur, but with teeth only on the flat face, (end), the sides being perfectly smooth. This gingival seat having been made perfectly flat, it should next be bevelled, very slightly, inwardly. This is done by slightly slanting the same safe-sided bur, so that it cuts on its edge first. The resulting wax pattern should show this edge of the inlay to be slightly bevelled, the inner angle therefore being a little sharper than a right angle.

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"IN ADDITION TO THUS forming the gingival seat we must next adopt some method which will resist all stresses which tend to force the inlay distally (remember that it is the mesial wall that is standing), and therefore away from and out of the cavity. For this purpose I select a small, square-edged carborundum wheel and cut a slot in the strongest part of the remaining wall. The bottom of this slot is then slightly bevelled away from the cavity, or toward the outer approximal surface. The result is an inlay firmly anchored in the gingival seat with a finger-like extension passing across the strongest part of the standing wall. In the case of the bicuspid under discussion the finger extension really passes across the mesial marginal ridge, and is kept out of sight within the embrasure, wide cutting not being required, because we do not cut down to the contact point.

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"IN MOLARS THIS METHOD may be utilized where the standing wall is strong. Where the standing wall is weak, the same principle is used, with a noteworthy variation. Instead of cutting a slot in the wall, I deliberately grind off the remaining cusp, or cusps, down to a fairly thick part of the wall. The wall thus lowered is at the same time greatly strengthened. Then slightly bevel the top of the wall toward the buccal, or the lingual surface, as the case may be. The inlay thus hangs over the wall, the wall and the inlay reciprocally protecting one another."

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"APPARENTLY YOU DO not approve of building up the tooth with cement, so that the usual step form of cavity may be cut?"

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"TO MY MIND THAT is one of the stupidest ideas that ever was promulgated. If the original cavity will not retain an inlay, how can it be made to retain an inlay by building back lost tooth substance with cement, merely to carry out some preconceived idea of cavity formation? The result must inevitably be simply an inlay,

the lower half of which is cement. Why should such an inlay remain in the cavity longer than one made entirely of gold?"

"DO YOU MEAN THAT one should never put a large mass of cement under an inlay?"

"NOT LITERALLY, though in principle, we may follow the carpenter's rule which reads, 'The less the glue the stronger the joint.' Sometimes where the cavity is so much larger within than along the margins that a useless deal of cutting would be necessary to so shape the cavity that the wax pattern could be withdrawn, it may be permissible to replace some of the lost dentin with cement, to facilitate forming the cavity without too much depredation to tooth structure. But in those, and in all cases, there are two essential factors of success that should be kept constantly in mind. First, the extra mass of cement must not be counted on for retention. Second, the cavity must be so formed that the inlay when set must exert absolutely no pressure upon the underlying mass of cement."

"I AM NOT SURE that I understand that."

"I WILL TRY to make it clearer. Let us suppose we have a pulpless molar with root canals filled and with the standing walls uniformly bevelled down to the orifices of the canals. There is a strong temptation to fill that cavity half full of cement, making the floor flat, but entirely of cement, with the surrounding wall slightly flaring, so that the wax is readily withdrawn. Such an inlay is easly made and easily set and looks fine. But it does not look so well a year or two later, when the patient returns with, let us say, a lingual cusp broken away. Why does this occur? Because the inlay was seated on a floor of cement, which, yielding under stress of mastication, permitted the wedge-shaped inlay to be forced downward, the gold likewise spreading under pressure if the occlusal surface was improperly carved, the result being a forcing off of the weakest part of the wall."

"DO YOU MEAN THAT in such cases the gold must go to the bottom of the pulp chamber? That would mean a great waste of gold, or else added expense to the patient."

"NOT AT ALL. BUT the inlay must not rest on the cement. That, of course, means that it must rest on tooth substance, and that can be accomplished with proper cavity formation. Where the pulp cham-

ber is not too large, it may be filled flush with what is to be the floor of the cavity. Then with the smooth sided, end cutting bur, a flat seat is cut all around the actual pulp chamber, thus allowing the inlay to rest on this ledge of tooth bone, precluding all undue pressure on the mass of cement. Where this cannot be done without weakening the standing walls, then the inlay must be seated in the top of the wall; so to speak, swung in. The walls may either be sharply bevelled, quite to the crest of the marginal ridge, in which case the bevel should be sufficient to produce a strong flange; a flange strong enough to prevent the inlay from being forced deeper into the cavity: or, where the walls are strong enough, two, or even four slots may be cut in the wall, say either across the mesial and distal marginal ridges; across the lingual and buccal sulci, or at all four places. The inlay then being seated in these extensions, cannot be forced down against the cement. In other positions, other precautions must be taken, but the fundamental principle is that the inlay must rest upon tooth bone, and not upon cement."

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"BUT DOES NOT an inlay always rest on cement?"

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"THAT, OF COURSE, is true. But the principle remains, and the less we depart from it the better. Where the underlying cement is very thin, the danger from the forcing of the inlay deeper into the cavity is minimized, because the less the cement, of course, the less it can be compressed. Indeed, there is a point beyond which cement cannot be compressed, and if the cement in the inlay joint could always be as thin as that, no further settling of the inlay would be possible."

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"WELL, IT IS GETTING LATE, and I suppose you want to go to bed. But this whole inlay proposition is not so simple as it seemed at first. Sometimes I get good inlays, and then again by exactly the same methods I get a failure. That puzzles me."

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"MY GOOD FRIEND, let it puzzle you no longer, because it is not true. If you follow certain steps in a given method and arrive at success, you cannot possibly retrace exactly the same steps and meet with failure. If I start from my house, taking the subway, intending to get off at Times Square, and if when I get out I find that I am at Fiftieth Street and Broadway, that is because I left the train too soon. If I find myself at the Grand Central Station, the explanation is that either I was inattentive and passed my station, or else I took an Express train instead of a Local, and consequently could not get out at my proper destination. But if I take the right train, keep

❖ my wits about me, and follow exactly the same course, I can get out
❖ at Times Square just one thousand times in a thousand. ❖ ❖

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"THE SAME IS TRUE of the casting process. The result at which we
❖ aim is always the same and unchangeable. We desire an inlay that
❖ will as accurately fit the cavity as the best made foil filling. To ob-
❖ tain such an exact result means studying out and following a most
❖ exacting technique in a most exact manner. It means a definite and
❖ invariable rule as to cavity formation. It means a definite and in-
❖ variable quality of wax. It means a definite and invariable tempera-
❖ ture at which the wax is used. It means a definite and invariable
❖ method of removing the wax from the cavity to avoid alteration
❖ thereof. It means a definite and invariable method of investing the
❖ pattern. It means a definite and invariable method of burning out
❖ the wax. It means a definite and invariable method of casting,
❖ with a definite and invariable quality of gold. The man who thus
❖ definitely and invariably practices the casting process will obtain
❖ definite and invariable success." 1916.

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COMMENT. The chief object of these "Comments" is to bring this
❖ book "up to date" so to speak. If methods described in our Table
❖ Talks have become obsolete, being replaced by newer and better
❖ methods, they are not here republished. If methods recommended
❖ still have some merit, they may be deemed worthy of republication,
❖ but some comment which might render them more practical would
❖ seem to be advisable. ❖ ❖

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IN THE ABOVE TABLE TALK the methods described are such as I
❖ had been using myself, and as I have used the suggested cavity
❖ preparations ever since, with uniform success, I can conscientiously
❖ say that they are just as practical now as then. 1928.

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XVIII.

WARD HAS BEEN IN TOWN. What Ward do I mean? What Ward should I mean? If I meant Jack Ward, or Joe Ward, or Jim Ward, I would say Jack or Joe or Jim Ward, as the case might be. But when I just say "Ward," naturally everyone knows I mean Marcus Ward.

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THERE IS ONE CHARACTERISTIC about this man Ward that well might be copied by other essayists. He does not write a great many papers, but what papers he does write are always worth reading. Why? Because the time spent by some men writing ten papers is used by Ward thinking about the writing of one paper.

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THERE IS A SORT OF DENTIST who is attacked by a new idea, new to him, I mean, say about five-thirty on a Monday afternoon. On Tuesday, at eighty-thirty, he tries it on his first patient and is proud of the result. By four P. M., same day, he is telling all his patients about "my method." At dinner he confides it to his wife. Wednesday, at ten A. M., he has a long telephone talk with an attorney, and on Thursday he receives a somewhat disappointing letter from said attorney to the effect that "the idea, though a remarkably fine idea, is not a patentable idea." "Oh, well!" says this sort of dentist to himself, "I'll present this to the profession." This, you understand, is Thursday, and he has been practicing "my method" on perfectly innocent patients ever since early Tuesday.

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CONSEQUENTLY, HAVING HAD all that experience, by Thursday evening, right after dinner, he is fully equipped to write his thesis. Of course, you know the difference between a thesis and a regular ordinary essay? No? Why an essay is a critical review by me of the faults in your method of doing things. But a thesis is an explanatory exposition of the advantages of my method of doing the same things. Get the idea?"

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SO THIS SORT OF DENTIST writes out his Thursday night thesis in long hand, and Friday morning he spends one-eighty-five to have

❖ it typed. In nice clean typewriting, with a pretty blue cover tagged
❖ to it, the "idea" looks better than ever. Ideas, like girls, always
❖ look best in the evening all dressed up. So naturally the Doctor
❖ must arrange for an evening session at which to introduce his "idea"
❖ to an eagerly waiting profession. Therefore he calls the Secretary
❖ of his Union, I mean Society, and after telling him that most of
❖ the snow has melted, and that it looks "Fair and Warmer," he
❖ casually remarks: "By the way, Charlie, if your program for next
❖ meeting it not any too good, I could give you something really
❖ worth while, if you would put me down for about fifteen minutes."

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THE PROGRAM IS ALL planned, but what can "Charlie" do? After
❖ some cajolery he agrees to give the man ten minutes, but when the
❖ man really gets on the rostrum with his thesis he uses up just twenty-
❖ three minutes by the big clock, which is right on the opposite wall
❖ where he could easily see it if he would only glance at it, but which
❖ he carefully avoids doing. ❖ ❖

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THUS AND THUSWISE does this sort of dentist present the pro-
❖ fession with his new and improved method of doing that which per-
❖ haps were much better not done. ❖ ❖

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THAT SORT OF DENTIST does that sort of thing because he is only a
❖ sort of dentist. But Ward is not that sort of dentist, and conse-
❖ quently does nothing of that sort. His latest essay dealt with the
❖ subject of amalgam. I listened closely to Ward (even refusing to
❖ listen to the man next to me and to the two behind me who were
❖ discussing the war), and I noticed an important peculiarity about
❖ Ward's paper. He expressed certain views, for example, explaining
❖ that his beliefs had been arrived at after a series of described experi-
❖ ments and tests. The statement of his deductions occupied perhaps
❖ half a page, whereas the tests and experiments upon which that half
❖ page was based must have occupied his time for many hours of
❖ several weeks. ❖ ❖

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AS I LISTENED TO WARD I learned the remarkable fact that the ex-
❖ pression, "an amalgam filling," has about two thousand different
❖ meanings, and nearly forty thousand different variations. I believe
❖ there are that many dentists, are there not? And the funny thing
❖ is that the patient, the poor deluded patient, thinks that an amalgam
❖ filling is just an amalgam filling; just as once we all thought that

❖ an automobile was an automobile, until we discovered that nearly
❖ half of them are Fords. ❖ ❖

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WHILE WARD WAS READING his paper I felt safe. I knew that I
❖ would not be called on to take part in the discussion, because the
❖ president, Brother Tracy, is a good friend of mine, and he knows
❖ that while I may, and perhaps often do, discuss things about which
❖ I know nothing, I never do discuss things about which I know that
❖ I know nothing. Consequently I felt safe as long as the main topic
❖ was the formulæ and general and chemical behavior of amalgams.
❖ But when the discussion opened and men began to talk about the
❖ uses and abuses of amalgam, I became so fidgetty I could hardly
❖ refrain from inviting myself into the debate. And so I quietly
❖ departed. ❖ ❖

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BUT DID I ESCAPE? I did not. I wandered off alone and really
❖ started for the subway station. But if you remember, that was the
❖ night of the blizzard, and the Manhattan Grill Room is right close
❖ to the subway, and you come to it first, anyway. So I invited my-
❖ self in to have a little something warm, with something warming on
❖ the side. ❖ ❖

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THEY TOOK SO LONG to roast my pheasant, that before it came in,
❖ three other dentists had found it impossible to pass the Grill Room
❖ door en route for the subway. The snow was pretty deep by that
❖ time, and walking was bad and taxi-cabs not working. Anyway, they
❖ percolated in, noticed me sitting there in company with three totally
❖ empty chairs, and joined me. ❖ ❖

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THERE WAS A CURIOUS FACT about those three men. They are
❖ all men with National reputations. They all have large practices,
❖ and yet they practice along totally different lines. They started
❖ right in to tell me about the paper of the evening, and more par-
❖ ticularly about the discussion which had taken place after I had left.
❖ Then one, more cautious than his fellows, remarked, "Better be
❖ careful, boys, or this Editor person will put all this in his paper."
❖ "If I do," said I, "I promise not to mention names." "Huh!" said
❖ the same man, "what difference will that make? You will make it
❖ so plain that everybody will recognize us!" ❖ ❖

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WONDER IF I CAN DO THAT? Let us see! One of the men is an
❖ orthodontist. Know him? No? Well, you ought to. I said he is
❖ an orthodontist. You know him now, don't you? I thought you

would. The second man is a dentist. Not a sort of dentist, but a regular dentist. His tooth filling records stand about like this: Gold, 70 per cent.; porcelain and silicates, 25 per cent., and amalgam, 5 per cent. Of course, I mean permanent fillings, and, by the way, his permanent fillings are permanent fillings. The third man is a dentist, too, or at least a sort of dentist. His filling charts read along the following lines: Amalgam, 70 per cent.; silicates and white gutta-percha, 30 per cent.; gold, a trace.

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WHAT IS THAT? MY ARITHMETIC IS WRONG? You say if this man uses 70 per cent. of amalgam and 30 per cent. of plastics, you don't see how there can be a trace of gold in his patient's mouth? Easy enough! He put those gold fillings in years ago, but nowadays when a cavity occurs adjacent to one of those perfectly good old gold fillings, my friend fills the new cavities with white gutta-percha if in incisors or cuspids, and with amalgam if in bicuspids or molars. You see those old gold fillings were good in their day and generation, but were inserted before we understood about extension for prevention. The new cavities, therefore, are only the result of extension (by recurrence of decay), and are easily cleaned out with spoon excavators and just as easily filled with one of the plastics. Thus the good old gold fillings go on "lasting," and my friend's reputation for "painless dentistry" continues to grow in the land that gave him birth. Everybody happy? Very well, then. Amen!

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THESE THREE MEN, all being close friends, and I might even say chums of mine, I let them have the pheasant, and ordered a club sandwich for myself. Not that I prefer sandwiches to pheasant, but I was not sure I could pay for two pheasants, and I hated to take out my roll and count it before company. I could get a sandwich more quickly, anyway.

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THE PHEASANT having been served with the nice crum sauces and jelly beside it, I took a bite of my sandwich and started the talk. "Fellows," said I, "I visited the Art Students' League recently and I saw a class of art students drawing from a living model. The model was posed in the centre of the room and the students were seated in a circle around him. The model happened to be a man. I went around behind those students and looked at their sketches, and I noted a fact that is well worth remembering.

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"NO TWO SKETCHES WERE ALIKE. Yet they were all practically true to life, and all drawn from the same model. The difference

depended upon the fact that the observers received their impressions from different viewpoints. What is the moral of this? We should not be narrow-minded. We should study problems from all aspects. We should not think that there is but one way of doing things, because we have been successful with that one way. Once in a while it might be a good idea for the students in the life class to exchange seats and study the model from a different angle.

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"HERE WE FOUR ARE SEATED AROUND A TABLE. Suppose, then, that I place a topic for discussion in the centre of the table. (Waiter, please remove the remains of that pheasant!) The topic is the one you have just heard discussed to-night. Amalgam fillings. I would like each of you to tell me how it looks to you? What are its uses and abuses?"

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"I GUESS I MAY AS WELL talk first," said the Amalgam man, "because I fancy I have had more experience than any of you with amalgam. Amalgam is the greatest friend that the dentist has. It has saved more teeth that otherwise would have been lost than all other filling materials put together."

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"YES, AND AMALGAM has ruined more teeth that could have been saved, than all other materials," interrupted the Gold dentist.

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"YOU ARE WRONG, ENTIRELY WRONG," said the Amalgam man. "Perhaps a very small percentage of teeth have been injured by fillings made with poor grade amalgams, but on the whole, and in spite of all that Ward told us to-night about the different formulas and the different grades of amalgams, ninety per cent. of failures with amalgams have been due to abuse, rather than to use of amalgam. No, my friend, it is not the amalgam that has ruined teeth, but the dentists themselves who have done it.

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"WE HAVE HEARD before, and we heard again to-night, a good deal about the crevices that open up through the shrinkage of amalgam. Before the advent of the gold inlay, the gold foil men pointed with pride at their beautiful margins, and scoffed and sneered at the crevices alongside of amalgam fillings. Yet these same men to-day have put away their gold foil pluggers and are inserting gold inlays, every one of which shows a gapping joint, compared with their abandoned foil fillings, and they are smugly content because they stop up the gap around their new-fashioned gold fillings with cement.

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"IF CHESTNUT STUFFING is good in a duck, why not in a drake? If cement will safeguard a poorly fitting inlay of gold, why not preserve your amalgam fillings in the same manner? In fact, is it not true that the first use of cement under a filling of any sort was in connection with amalgam? Did not this use of cement under amalgam lead to the abandonment of the starting pit for gold foil, and the cementing of the first pieces into the cavity? And from this did we not gradually pass to cementing in our beautiful gold fillings which had fallen out? Did we not thus learn that cavities so large that the remaining tooth substance could not be sufficiently undercut to retain a foil filling could yet be permanently saved by cementing that same filling back into the cavity after it had fallen out? Did we not thus gradually see that we would save our patients much pain if we could make our gold fillings out of the mouth and then cement them in?

"LET US THEN BE FAIR to amalgam. Give it the same chance as gold. Prepare the cavity properly; use a proper amalgam and use it properly. Then safeguard your cavity from future discoloration and from future fracture of walls and from future recurrence of caries by cementing the amalgam in the cavity."

"THAT IS ALL VERY NICE," said the Gold man, "or will be nice when the Millennium arrives. Someone said to-night that to-day eighty per cent. of all posterior teeth filled in this country are filled with amalgam. But, my good friends, of all those teeth filled with amalgam, how many are filled with the care and in the manner described by our friend on my right? I might make a joke and say that my friend on my right is not right at all. He is decidedly wrong. We cannot judge a material by what may be done with it; we must judge it by what is done with it."

"I DO NOT SEE THAT," interrupted the Amalgam man.

"I CAN MAKE YOU SEE IT," said the Gold man. "The great fact to be reckoned with in computing results is not what may be done with amalgam, or with gold, but what is done with it. The fact that amalgam may be used in a slipsod fashion and quickly inserted; the fact that success, real success, with amalgam entails a trying technique and at least two sittings for the making of one filling; the fact that the patient looks upon amalgam as a cheap filling to be accepted only because he cannot afford gold; all these factors, and especially the last great economic truth, leads to the inevitable result that, considered broadly, amalgam is not so good a filling material as gold.

The attitude of the patient towards amalgam, and the fee that he will pay for it, forces the dentist to use amalgam, not in the way that is best for the patient, but in the manner that is best for himself and his family. He is in the position of a jeweler who sells a diamond with a flaw in it to his customer who cannot afford a diamond without a flaw. And he is honest about it, too. He does the best he can for the fee paid. Do not scold him if the tooth only lasts ten years after it is filled. The dollar fee that he got for the filling was pretty small for the service rendered. Ten cents a year for the use of a tooth is not so bad. That sort of amalgam filling, bad as it is, is the half-way house between the gold filling and a pair of forceps."

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"I DO NOT FOLLOW YOU," said the Amalgam man. "Instead of using amalgam in a slipshod manner and saving a tooth for ten years for one dollar, why not take a little more time, do it properly, charge two dollars and save the tooth for twenty years?"

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"BECAUSE THAT AGAIN is an economic impossibility. The man who is forced to fill a large cavity with amalgam for one dollar has not the time to educate his patients up to the point of doubling the fee on the promise of doubling the life of the tooth. And even if he could persuade the patient to his point of view, he cannot afford to properly insert and finish amalgam for only twice as much as he gets for the easier way. He would require four or five times the fee."

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"YOU ARE WRONG," said the Amalgam man.

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"I AM NOT WRONG," said the Gold man. "The trouble with you is you never have worked for poor people. You grew up in an established practice. I started in a cheap practice. Low-priced work for the common people. My 'boss' called it 'dentistry for poor people.' But I soon leraned that it was 'poor dentistry for the people.' So I got out of that environment at the first opportunity. But that is aside from the argument. The facts are like this. It is well known by both patient and operator that skill is required for making a gold filling. Gold, too, is the metal of money, of jewelry, of luxury. It therefore commands respect from all people. People who buy gold jewelry expect to pay for it. But they will not pay the same price for a brass imitation, however perfect and artistic the imitation may be. And, mind you, as an ornament, which is all that jewelry is intended for, a string of imitation pearls is just as good and just as decorative as the best of the real ones.

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"THE FACT THAT it requires skill to insert a gold filling compels the operator to acquire skill in order to use the material at all. The fact that it is gold renders it easier for him to collect an adequate fee for it."

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"HOW CAN THAT BE TRUE? If the patient cannot afford two dollars for a good amalgam filling, how can the dentist persuade him to pay for gold?"

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"JUST BECAUSE IT IS GOLD. You are wrong about that two dollars. Suppose that the cavity is a large distal approximal cavity in a lower molar in a wet mouth. To fill that properly with amalgam the cavity must be kept dry. That means the rubber dam, a matrix, the mixing of cement, and the insertion of the cement and the amalgam. It means the return of the patient for a subsequent sitting for the polishing. For that, the present amalgam man must have at least five dollars. Can he collect five dollars from that patient for an amalgam filling? He cannot. Can he collect five dollars for a ready-made gold crown jammed over the entire tooth, with occlusion corrected before stiffening the top with solder, by requesting the patient to 'close the mouth please?' He certainly can; he certainly does. Hence the prevalence of the gold shell crown, one dollar down and a dollar a week, in the mouths of folks working for ten dollars a week and less. The same people have onyx clocks on their mantels and red plush furniture in the 'parlor.'

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"THE GIRLS in these families, good girls, too, and pretty girls, wear high white kid boots that cost five to seven dollars a pair; and they have their skirts trimmed with seal skin that never saw any seal's back, and they have lace on their lingerie. These girls will pay for gold in their front teeth; which is another strange psychological fact, because here they could be better served with less expense by having one of the silicate cements. They prefer the gold because they get 'a show for their money.' But will these nice little American girls, working for from eight to twelve dollars a week, pay for properly made amalgam fillings in back teeth? They will not.

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"NOW THAT PLATINUM is so much more costly, and therefore so much more fashionable than gold, it might not be a bad idea to suggest that 'we get one dollar for amalgam, but we can fill that with platinum for five dollars, and it will be five times better.' I think it would be almost an excusable deception, if the deceiver would then only insert the 'platinum' according to the method which my friend here admits is necessary to make it a success.

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"FINALLY, I SUPPOSE I should tell you how amalgam looks to me in the practice that I have now among people who do not ask for itemized bills, nor dictate to me with what they want teeth filled. I consider the gold inlay in the grinding teeth the best filling, because with it I can serve my patient more perfectly from the standpoint of saving the teeth, as well as restoring the function of the teeth, and for less money than with amalgam. Occasionally, very occasionally, cases will arise where a really better and more lasting service can be rendered with amalgam than with gold. My fees do not depend upon the material used, but upon the service rendered. Thus, in the exceptional conditions where I would choose amalgam in preference to gold I probably would charge a higher fee than for many of my gold operations. Under such circumstances, of course, I can give to my amalgam filling all that technical attention needed to produce a finished and perfect result."

"LET US NOW HEAR from the Orthodontist," said I.

"OF COURSE," said the Orthodontist, "I am not practicing dentistry now, but I did practice dentistry in all its phases before these days of specialization, and I know the game from the practitioner's standpoint. But I take it you want my opinion of amalgam from my present outlook, and that, of course, is entirely different from that of the previous speakers. Let me admit all that the last speaker has said about the economic impossibility of rendering good service to the poor with amalgam. But, Friends, don't fool yourselves. The poor have no monopoly of bad dentistry. Naturally, in my present field of work (at least in my office, and not at the dispensary), I see mainly the children of the rich, or the near rich. Their dental work is mostly done by men claiming to get ten dollars an hour. Some are asking fifteen. Do these patients have nothing but gold in their mouths? They do not. Do I see many amalgam fillings in children's mouths? I certainly do. Are they good amalgam fillings? They are not. Are they all nicely carved on the occlusal surface and nicely polished? About five per cent. of them are. The other ninety-five per cent. never felt carver nor polishing tool. Where I find amalgam fillings occupying approximal surfaces of teeth, are these fillings nicely polished? They always are, because I invariably separate the teeth and polish those fillings myself. Otherwise, you see, I could not make my bands fit properly. Then, too, I cannot afford to risk blame for recurrence of decay attributed to my misfit bands, when it really recurs because of misfit amalgam fillings. Do I think these amalgam fillings that I see worth ten dollars an hour? I do not. Do I think that a dentist

❖ receiving ten dollars per hour should be able to properly fill a tooth
❖ with amalgam? I think that a dentist in that class is a malpracti-
❖ tioner when he does less than his best for these defenseless little
❖ folks. ❖ ❖

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"THERE MAY BE some excuse for poor dentistry by dentists working
❖ for the men, women and children of the Ghettos, of the Alleys,
❖ the Slums, and the Sweatshops, but there is no excuse for the bad
❖ dentistry seen in the mouths of the rich, and especially in the
❖ mouths of the children of the rich. ❖ ❖

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"THERE IS PERHAPS an explanation, however. The successful ortho-
❖ dontist is successful largely because he loves little children; because
❖ his love for a child is so great that often the child is safer in his
❖ hands than in the hands of its parents; because working almost ex-
❖ clusively for children he gains added skill in that direction day by
❖ day. A few dentists are like that; but they are all too few. If men
❖ who really love children and who really understood children would
❖ specialize in children's work, perhaps we would see better dentistry
❖ in the teeth of children. ❖ ❖

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"MY BROTHER TO MY LEFT mentioned that he prefers the gold
❖ inlay because with it he can better restore normal function. Amen
❖ to that. But men like Frahm and Pond have shown that even
❖ amalgam may be carved into some semblance of occlusal form.
❖ This is so essential to the final retention of teeth which have been
❖ moved from malocclusion into proper occlusion that the orthodontist
❖ is exasperated when his finished product is finally ruined by the
❖ recommending dentist, who, receiving the patient back into his care,
❖ fills the molars with amalgam, wiping off the occlusal surface with a
❖ bit of wet cotton, and polishing the filling with prayer. What I
❖ say about those men in my prayers I hope some day will happen
❖ to them. And perhaps some day I will give the parents of the
❖ children a copy of my prayers. Now, Mr. Editor, how does it all
❖ look from your viewpoint?" ❖ ❖

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"BEING PARTLY DENTIST, PARTLY ORTHODONTIST, and some-
❖ times editor," said I, "I am accustomed to look at these problems
❖ from many angles; so I can say honestly that in the main I agree
❖ with all three of you. ❖ ❖

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"I AGREE WITH the first speaker in his contention that a good amalgam
❖ filling that will save a tooth can be made. With the second speaker

❖ I agree that a good amalgam filling is a rarity. With the orthodon-
❖ tist I say Amen! to those silent prayers of his." 1916.

卐————卐

COMMENT. In compiling this work, as I read over and study each Table
❖ Talk, naturally I endeavor to analyze it to determine to what extent
❖ it is applicable to the best practice of to-day, and what, if any, report
❖ should be given of the progress that has been made on the methods
❖ discussed. ❖ ❖

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I FIND THIS TALK on the merits and demerits of amalgam fillings
❖ singularly interesting, because the times have so greatly changed in
❖ many respects, while the methods of using amalgam have altered
❖ so little, if at all. ❖ ❖

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FOR EXAMPLE, amalgam fillings at one dollar each are mentioned, and
❖ dentists working for ten dollars per hour, though a few are quoted
❖ at fifteen. And gold shell crowns at five dollars each. Is that done
❖ now? Hardly, yet the higher prices received for amalgam fillings
❖ and for gold crowns do not seem to buy the patients any better
❖ service. ❖ ❖

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ONE OF THE DISCUSSERS speaks of girls who "wear high white kid
❖ boots that cost from five to seven dollars a pair; and they—have
❖ lace on their lingerie." ❖ ❖

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TODAY THE SAME TYPE of girls pays from fifteen to seventeen
❖ dollars for strap slippers, or Russian boots, and wears no lingerie at
❖ all. At least, one who pretends to know has said that the modern
❖ girl wears three garments, and that two of these are stockings. ❖

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THESE FACTS ARE mentioned not because they are of importance to
❖ the student of dental methods, but merely to accentuate the fact
❖ that whilst revolutionary changes have occurred in nearly all things,
❖ the truths above stated in regard to amalgam fillings are still true.

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THE REPORTED TABLE TALK indulged in by four men contained
❖ very little by the present writer. Since that date, however, he served
❖ as Chairman of the Committee on Dental Research, of the Dental
❖ Society of the State of New York, and quotations from his report
❖ on that research will be pertinent here, and will serve to bring this
❖ topic fairly up to date, as the report was delivered in May, 1925.

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THE MEMBERS of this Research Committee were Dr. E. I. Harrington,
❖ of Watertown; Dr. A. W. Smith, of Rochester, and the present

writer. At the request of the Committee the President added Prof. C. F. Bödecker, Histologist of Columbia University Dental School. Dr. Bödecker contributed some valuable data in regard to failures with amalgam. The full report may be found in The Dental Cosmos, October 1925, P. 998-1015.

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THE INVESTIGATORS did not undertake to determine what can be accomplished with amalgam, but rather they endeavored to determine what measure of success is being attained with "amalgam as it is commonly used."

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AS A MEANS to this end the Committee collected and examined extracted teeth, which contained amalgam fillings. The results of the separate investigations of course varied, but were remarkably similar nevertheless. As my own report was based on a greater number of examinations (1067) than those of the other members, it will suffice to quote them only. Failures found on buccal surfaces, 69 per cent.; on occlusal surfaces, 17 per cent.; on approximal surfaces, 80 per cent. Failures, based on an examination of all surfaces, 50 per cent.

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IN THE TABLE TALK above quoted the orthodontist made the following sapient remark: "Where I find amalgam fillings occupying approximal surfaces of teeth, are these fillings nicely polished? They always are, because I invariably separate the teeth and polish them myself."

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THIS MATTER OF THE POLISHING of amalgam fillings seems to be the chief stumbling block to success with amalgam. "Dr. Harrington reports that he found 10 per cent. of fillings polished. Dr. Smith found that 44 of the 285 examined by him had been polished, a percentage of 17, and it is significant that he has marked all of these as "good." In other words, he found no recurrence of decay around any filling that had been polished. It should also be mentioned, however, that of these polished fillings that were successful 30 were in occlusal surfaces, only 5 in buccal and 9 in approximal surfaces."

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THE POINT TO BE STRESSED here is that polished, or not polished, amalgam is most successful in occlusal surfaces. Indeed failure is mainly due to incomplete cavity cutting; the leaving of sulci that should be cut out. Attrition achieves a modicum of polishing of occusal fillings, that of course will not occur in approximal surfaces.

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MY OWN RESULTS were reported thus: "Examined 1067; polished, 97; percentage polished .09 per cent."

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THIS SUBJECT of filling teeth with amalgam is so tremendously important, success seeming to be so easily attained and yet so seldom achieved, that the following extract from the Research Committee's report is herewith reproduced, especially for the benefit of young graduates who may have come to believe that "amalgam is a good enough material, much easier to handle and much cheaper than gold."

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"APPROXIMAL SURFACES. Our investigation has shown such tremendous percentage of failure on the approximal surfaces that we must make some special comment thereon. The reasons for these failures are as follows: The difficulty of properly filling approximal surfaces so as to avoid overhang at the gingival margins. The difficulty of properly condensing that portion of the amalgam which is in actual contact with the gingival margin. Dr. Harrington alludes to this, and Dr. Bödecker beautifully shows it in at least one of his slides. Lastly, the difficulty of properly polishing the approximal surface and of maintaining approximal contact at the same time.

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"RECURRENCE OF DECAY IS, of course, further invited if the interproximal soft tissues have been injured and consequently atrophied, which is practically always the case when the cavity extends to, or below the gingival margin.

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"I HAVE STATED that amalgam cannot be accounted a cheap filling. By this I mean that we cannot consider it a cheap method of filling teeth, more especially cavities involving the approximal surfaces, if we are to adopt such a course as will really offer the best chance of saving the teeth.

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"I CONSIDER THIS of such vast importance that, at the risk of being accounted tediously verbose, I desire to touch upon the technique necessary for success.

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"LET US SUPPOSE that the patient presents with a distal approximal and occlusal cavity in the first lower molar, and a mesial approximal and occlusal cavity in the second lower molar. It will be noted that these cavities would be contiguous. Let us suppose that the cavities reach, but do not pass below the gingival margin. It would be vastly more difficult were the cavities extending below the gingival margin,

❖ but I do not wish to be so extreme in this hypothetical case as to ❖
❖ render success almost, if not quite impossible. ❖ ❖

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"IN SUCH CASES it will be common to find that the gingival margins ❖
❖ of these adjacent cavities will be quite close together. ❖ ❖

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"THE COMMON METHOD, the 'cheap method' of filling such cavities ❖
❖ is to clear out the decay, fill one cavity with gutta-percha and the ❖
❖ other with amalgam. This is one sitting. At the next sitting per- ❖
❖ haps some effort is made to polish the first filling, but in managing ❖
❖ the filling along the gingival margin, the flow of blood discourages ❖
❖ the dentist, especially as it delays his filling of the adjacent cavity. ❖
❖ Hence he leaves that filling only partly polished, if polished at all. ❖
❖ But let us take the most optimistic view, and suppose that he success- ❖
❖ fully and thoroughly polishes this first filling. He then fills the ❖
❖ second cavity, bringing it flush against the approximal surface of ❖
❖ the one first inserted. In the vast majority of cases, that would termi- ❖
❖ nate the operation. Two fillings inserted at two sittings; one polished ❖
❖ and the other not polished—this is the cheap amalgam method. A ❖
❖ third visit for polishing cannot be afforded at the price. ❖ ❖

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"BUT LET US SUPPOSE that the patient is returning for other work; ❖
❖ then there is a chance to polish that second filling. What occurs? ❖
❖ The occlusal surface is polished and the lingual and buccal margins ❖
❖ of the approximal areas, perhaps. But no effort is made to really ❖
❖ polish the entire approximal surface, because to do so would leave ❖
❖ a space between the teeth, and the patient would return complain- ❖
❖ ing of food packing between the teeth. Actual approximal contact ❖
❖ therefore is attained by leaving the contact point unpolished. In a ❖
❖ very bell-shaped crown, some dentists might endeavor to pass sand- ❖
❖ paper strips below the contact point, polishing, if possible, the actual ❖
❖ gingival margin. This generally is but indifferently accomplished ❖
❖ because of sawing against the gingiva and the flow of blood, which ❖
❖ removes the grit from the sandpaper. ❖ ❖

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"THE 492 APPROXIMAL SURFACES examined by myself, of which ❖
❖ only 86 did not show recurrence of decay, abundantly prove that this ❖
❖ is the common practice. And this is the more significant when I ❖
❖ state that of the 86 which had not failed, a large proportion had been ❖
❖ similarly treated; no approximal polishing, and approximal over- ❖
❖ hang of the filling at the gingival margin a frequent occurence. ❖
❖ These teeth had not decayed again, either because they had been ❖
❖ lost too soon, or else because of a very high immunity in the ❖
❖ mouth. ❖ ❖

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"I MUST PAUSE here to remind you that immunity to decay is a little understood condition. It is fleeting. It may exist for a time, and then suddenly again we may have onsets of decay. We have not time to discuss this here. It is alluded to merely as a possible explanation of the fact that a person may suffer extensive caries in a tooth, the tooth may be very badly filled with amalgam, and yet the amalgam may apparently 'save' the tooth because a period of immunity sets in.

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"HAVING OUTLINED the cheap way of filling compound cavities with amalgam, I wish now to outline a technique which affords a possibility of filling these two cavities with amalgam, and of obtaining highly polished fillings with good approximal contact.

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"THE FIRST ESSENTIAL is that the teeth must be freely separated. The second is that matrices must be used. There are several types of matrices, more or less successful in the hands of those that become skilled in their use. But, to my mind, the most reliable matrix is the continuous band, cemented to place. In many instances I use a gold band because it is thinner and can be forced between teeth that are fairly close together. Perhaps the bands most used would be the copper bands supplied by certain manufacturers for measuring root diameters when ordering ready-made crowns.

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"LET US SUPPOSE that we decide to use copper bands for matrices. If possible to pass the bands between the first molar and bicuspid, in the one instance, and the second and third molars in the other, one sitting will be saved. If the bands cannot be forced between these teeth, as is often the case, then separating silks must be placed mesially of the first molar and distally of the second molar. This, with some preparation of the cavities and the insertion of temporary fillings, will occupy the first sitting. At the second sitting the cavities should be thoroughly prepared, special care being given to the margins, and a band cemented around each molar. One advantage of this continuous band matrix is that the gingival border may be contoured to pass below the gum margin and should be slightly everted toward the root of the tooth which it surrounds, thus presenting a smooth, rounding surface toward the gingiva. The two bands are cemented to place, care having been taken to smear the actual cavity margins with vaseline so that when partly set the cement may be cleared away therefrom. At times, this is all that can be done at this sitting, and really it is preferable not to do any more, for fear of dislodging the freshly cemented band.

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"WITH TIME, however, and with care, the rubber dam may now be applied, the margins of one cavity thoroughly cleared of cement, and a filling placed in one tooth. It should be mentioned here that, besides actually clearing away the cement from the margin, the band metal should be slightly forced away from the margin, so that there will be a slight overlap of the filling. Whether this first filling is inserted at this second sitting, or whether the cavities are temporarily filled with base-plate gutta-percha, which is the preferable course, heavy separating silk should be placed between the two bands to procure wide separation.

"PRESUMING that we are following the best methods, the use of temporary fillings at the second sitting, then at the third the gutta-percha is removed from one cavity and the copper band is bent into contact with the adjacent band, thus serving to maintain the separation and also to overbuild the filling, thus allowing for surface removal when polishing.

"AT THE FOURTH SITTING the rubber dam is again placed, the band removed from the filled tooth and the filling thoroughly polished. The band on the adjacent tooth is then burnished into sharp contact with the filling that has been completed, the amalgam is inserted and the patient dismissed, with the band, as in the first instance, serving to protect the amalgam while hardening, and especially preventing the material from being pushed up over the gingival margin and against, or under the soft tissues.

"AT THE FIFTH SITTING the second band is removed, the dam placed and the filling polished, care being observed not to remove too much of the area of interproximal contact.

"BY THIS TECHNIQUE, the best results may be obtained that are obtainable with amalgam. But four or five visits are needed for the filling of two cavities. It cannot be called a cheap method. Indeed it would be 'cheaper' from the dentist's viewpoint to insert gold inlays. There is just as much work entailed, and the time saved when inserting the gold inlays should more than offset the actual cost of the gold used.

"IT WOULD seem, therefore, that the failures with amalgam are largely traceable to so-called 'economic' reasons, wherein, however, there is no real economy for the patient." 1928.

XIX.

I HAVE OFTEN HEARD the remark, "The world is very small." Those ❖ that make this assertion speak very positively, just as though they ❖ knew all about it. Personally I am not fully informed as I never ❖ have walked around this little Globe of ours—not the whole way ❖ around anyway. Besides I never do walk if I have the price for ❖ a taxi, or am with a friend who has the price, which is just as good, ❖ and more economical. ❖ ❖

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BUT I DO KNOW THIS! In this world you never can tell where you ❖ are likely to meet folks, and conversely if you want to escape from ❖ meeting folks you are apt to find yourself like the girl in the song ❖ who was, "All dressed up with no place to go." I know about this ❖ because I tried it only last summer. I spent most of my vacation, ❖ trying to forget dentistry, in the mountains. In a great many ❖ mountains. Guess I was trying to hit the high places. Anyway this ❖ is how it worked out. Fourth of July found me over night in a ❖ rustic hotel up eight thousand feet on Long's Peak, Colorado. After ❖ supper who should drop in (drop in is the correct statement because ❖ he had been up to the summit, eleven thousand feet) but Orton, ❖ Prof. Orton of the University of Minnesota. Naturally we for- ❖ gathered Around a Table and had a little Talk. ❖ ❖

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NEXT DAY, PASSING THROUGH Estes Park we noticed a pretty ❖ bungalow and stopping to look it over came cheek by jowl, as it ❖ were, with three dental Brothers from Denver. They were just ❖ about opening a combination summer home and dental office. Seven ❖ thousand feet above sea level. Think of that! Dentists! Dentists ❖ everywhere, etc., etc. Well they showed us around their shack, and ❖ then we sat a few minutes around a table, but I managed to confine ❖ the talk to the colors they ought to use to paint their place. If there ❖ is one thing above another that one man can tell another man, it is ❖ how to run his, the other man's business. I don't know whether ❖ they adopted my color scheme or not, but it was a good color ❖ scheme anyway. And they were and are nice fellows, too. ❖ ❖

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THEN I CAME BACK EAST and went to the Adirondacks. I went

❖ to quite a number of places in the Adirondacks, but it was always ❖ the same. At Long Lake a dentist asked me: "Do you use euca- ❖ percha in root canals? If not, why not?" At Keene Valley another ❖ dentist inquired: "Is it true that Rhein always protrudes a gutta- ❖ percha cone a quarter of an inch through the foramen? If so, ❖ what is the idea?" At Lake Placid a local practitioner asked: ❖ "How does Callahan know when a canal is full of rosin, and if it ❖ is filled with rosin how does he get any gutta-percha in afterwards?" ❖ At Au Sable Chasm a touring dentist remarked: "I noticed a picture ❖ of canal broaches all wrapped up in cotton and setrilized ready for ❖ use. Dr. Best's method. Now as a photograph makes a thing look ❖ smaller than it is, and as those rolls of cotton in Best's picture are ❖ larger than any canals I ever saw, I wish you, or Best, would tell ❖ me how large you make a canal anyway. What?" ❖ ❖

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AT SARANAC AN ALLEGED DENTIST told me that I could save ❖ lots of time and thousands of teeth if I would fill all root canals ❖ with ordinary "pitch," whatever that is. And he remarked unctu- ❖ ously: "And I was doing that before Callahan ever even saw a piece ❖ of rosin." And so it was at every place. Everywhere a dentist, ❖ and every dentist with something to ask about root canals. But the ❖ climax came at Bluff Point. The hotel piazza lights had been put ❖ out; the Moon was full and bright; and some nude or semi-nude ❖ dancers were doing Greek figures on the grassy sward. Now "grassy ❖ sward" sounds very poetic, and barefoot dances in the moonlight may ❖ be very classic, but for my part I would prefer regular footwear ❖ and a waxed floor. It is less prickly! Well, there I stood, with the ❖ rest of the onlookers, by the piazza rail looking at the shadowy ❖ forms of the dancers, and thinking of anything but dentistry, when ❖ over my shoulder and out of the dim and dank darkness behind me, ❖ a mysterious and unknown voice whispered: ❖ ❖

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"DOCTOR! TELL ME SOMETHING! What is a granuloma? One ❖ man told me that a granuloma is made up of adventitious tissue; ❖ though I guess he meant advantageous tissue. But if it is advan- ❖ tageous tissue, why, nowadays, are we all so wrought up over it? If ❖ a patient has one of these modern attachments on his tooth and does ❖ not know about it, and you yourself do not know he has it, why take ❖ an x-ray to find out? It puzzles me. What about it? Can you ex- ❖ plain?" ❖ ❖

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DO YOU BLAME ME for leaving the Adirondacks? Well I started ❖ for San Francisco. Ten dentists on the train right from the go off,

❖ and more getting on at every station. By the time we reached ❖ Colorado Springs there were sixty; all nice fellows, too. Still a good ❖ deal of the conversation was about dentistry. We took a side trip ❖ to Cripple Creek and when the party started on their way for the ❖ Coast that afternoon, somehow it happened that I missed the train. ❖ By 7:30 A. M. next day, before any dentists were out of bed, I was ❖ "on my way" to Pike's Peak. Didn't go directly either, but trolleyed ❖ over to Manitou, and after making sure that I had not been fol- ❖ lowed, I took the Manitou Inclined Railway and went up about ❖ nine thousand feet. Thence, again making sure that no one was ❖ on my trail, I started across the regular footpaths for Pike's Peak, ❖ two miles away. ❖ ❖

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I HAD A GLORIOUS WALK, and arrived at what they call the Half ❖ Way Inn, on Pike's Peak, with a good appetite for luncheon. I ❖ selected a nice little round table in a sunny corner, where I got ❖ a good view of a babbling brook, and ordered some Pumpkin Pie ❖ and a couple of glasses of Milk, and was just about to enjoy myself ❖ when a nice-looking party dropped into a chair opposite to me ❖ and casually remarked: ❖ ❖

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"A GOOD MANY MONTHS ago, Doctor, in your Around the Table ❖ Talk, you said you would take up the subject of adjusting the rubber ❖ dam again some day. I have watched ever since for you to do this, ❖ and you have not said any more. Could I ask you a few questions?"

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AND THIS WAS ON PIKE'S PEAK, about eleven thousand feet above ❖ sea level! ❖ ❖

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THE WORLD MAY BE LARGE, but it did not seem so very large that ❖ day. However one must be pleasant and fraternal, so I invited my ❖ Brother to proceed, and he proceeded. ❖ ❖

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"YOU HAVE MADE THE POINT," said he, "that root canal work ❖ must be aseptically done, and that therefore the rubber dam is a ❖ necessity. Now there are many places where I find it simply im- ❖ possible to apply the dam, and I would like to describe a few of ❖ these to you and ask how you do it. I remember that you recom- ❖ mended using a band made of German silver, or other metal, but ❖ it seems quite a bit of added trouble, to make a band for every ❖ case." ❖ ❖

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"SINCE I MADE that recommendation," said I, "Callahan has pointed out that there is on the market a box of seamless copper bands which are put out in conjunction with a crowing method, but which serve admirably for this purpose of banding teeth in order to apply the rubber. These bands come in assorted sizes, large enough for the largest molars and small enough for lower central incisors. I would like them better were they made of slightly thinner metal, but even as they are, they are satisfactory. The worst difficulty is that occasionally a tooth must be separated on both sides, before the copper band can be adjusted, but that only delays the work for twenty-four hours, and often is an advantage in the final making of the inlay or filling.

"BEING MADE OF COPPER these bands are soft enough so that they are easily stretched, if the exact size cannot be found in the assortment. Indeed it is better to select a band a size too small and carefully stretch it to a tight fit, rather than to use one too large and have it irritate the gum."

"BUT HOW CAN YOU use seamless bands without trimming off the enamel of the natural tooth to make the band fit at the neck?"

"REMEMBER THAT THESE BANDS, unlike the shell crown, are used only for a temporary purpose and are left in place for two or three weeks at most, though in emergencies I have left them on for two or three months. The metal is so soft that it is easily burnished to the tooth neck at the time of cementation. Indeed this is requisite for the comfort of the patient. The edge of the band towards the occlusal should also be perfectly burnished to the tooth, and should then be nicely polished with stones and sandpaper disks so as to present a smooth surface to the tongue. Now then suggest a place that you think would be difficult and see if I can solve the problem for you?"

"WELL, THEN," said my new found friend, "suppose we have a distal approximal cavity in a lower molar, with cavity margin well below the gum."

"THAT IS A RATHER SIMPLE problem," said I. "It might be much more complicated. But let us first consider it just as you describe it. This sort of cavity cannot be protected with the copper band just as it comes to us. The band must be trimmed away at all other sides, so that the part which is to cover the distal gingival cavity

margin is a deep festooned extension, as it were. In other words the edge of the band which is to be towards the gum should be so trimmed that when this edge is just at the gum everywhere else, that part that surrounds the cavity is deep enough to extend down beyond the actual gingival margin. This is not always possible, though it nearly always is. Where it is not actually accomplished there is still a way out. But let us proceed in order.

"HAVING TRIMMED AWAY the band so that it follows the gum margin accurately, the extreme edge of the festooned extension should be slightly inverted inwardly with small pliars, so that when pressed to place the actual edge will be toward the tooth surface, and a rounding surface of the band will present towards the gum. This permits pressing the band down without irritation, or injury to the gum.

"OFTEN THE GUM at this point between the teeth is found so irritable that it will bleed copiously at the slightest provocation. Sometimes for this reason it is not advisable to attempt to cement the band to place at the first sitting. In such cases the band should be forced to place, the cavity wiped dry and then packed solid with gutta-percha, or temporary stopping. At the next sitting the temporary filling and then the band should be removed gently and cautiously, so as to avoid starting a hemorrhage, and the band may then be cemented to place.

"THE METHOD OF CEMENTING the band includes an important bit of technique. The cement should be mixed fairly stiff; at its most adhesive stage and when it is just about to begin to set, the band is smeared throughout its entire width at all places where it is to cover the undecayed outside of the tooth; but along the edge which is to cover the cavity margin, the cement should only be placed along the lower edge of the band. The band is then quickly forced to place and held firmly, while the edges of the band are burnished tight against the enamel of the natural tooth. By the time this is done, the excess of cement along the cavity margin, which has been forced into the cavity by the adjustment of the band, will have arrived at a putty-like consistency, easily manipulated. At this stage a large ball burnisher should be used to force this excess of cement against the band, along the actual cavity margins and along the floor of the cavity, almost but not quite to the opening of the distal pulp canal. In a few minutes, this will harden sufficiently to permit adjustment of the dam, when the cavity will be found easily kept dry. The packing of the cement against the band and along the

❖ cavity margins and partly across the floor towards the canal open-
❖ ing, is an important phase of this technique as it not only assists
❖ in holding the band in position, even on badly formed teeth, but
❖ likewise materially helps the damming away of oral fluids. ❖ ❖

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"WHERE IT IS FOUND IMPOSSIBLE to extend the band quite below
❖ the distal cavity margin, moisture may be excluded as above de-
❖ scribed, except that the cement packed along the margin should be
❖ placed at a second sitting, care being taken not to start a hemorrhage.
❖ The dam is adjusted and temporary filling removed. Then the
❖ cavity should be thoroughly dried and the cement, mixed to the
❖ consistency of putty, may be placed along this margin, and when
❖ hardened will perfectly stop the 'leak.'" ❖ ❖

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"YOU SAID THAT THIS CONDITION could be more complicated,"
❖ said my friend. "What did you mean?" ❖ ❖

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"WE MIGHT HAVE the same condition complicated with a cavity along
❖ the buccal margin also. But that is of no great consequence as the
❖ buccal cavity can be filled with gutta-percha first, and the procedure
❖ then would be the same as already described. Perhaps the most
❖ trying cases in the molar region are not so much those where the
❖ cavity extends below the gum margin, as where we find that the
❖ decay has crept along the gum line around the disto-lingual angle.
❖ By the time the lingual angle wall is cut away so as to fully diclose
❖ the extent of the decay, the rubber, if put on, would ride across and
❖ hide about one quarter of the gingival margin, and even clamps will
❖ not hold it away. Experience teaches that it is time wasted to try
❖ to adjust the dam in these cases without first fitting a band. All
❖ such attempts result in causing hemorrhage, which increases the
❖ difficulties. Neither is it wise to attempt to fit a band for the same
❖ reason, viz.; bleeding. In these conditions the correct procedure
❖ is to first fill the cavity with gutta-percha, and very carefully con-
❖ tour the same, restoring the lost portion and bringing the gutta-
❖ percha flush with the cavity margin along the gum line. As the
❖ trimming of this gutta-percha may likewise cause bleeding, some
❖ may find this more easily accomplished with one of the temporary
❖ cements. ❖ ❖

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"HAVING THUS TEMPORARILY FILLED and restored the contour
❖ of the tooth the band may be fitted, and then cemented to place.
❖ At the next sitting the dam may be adjusted, the gutta-percha or

temporary cement removed, and the margins of the cavity sealed as previously described with cement mixed to putty-like consistency.

"BICUSPIDS ARE SOMETIMES even more troublesome than molars, partly because they may be more bell shaped, and partly because they are nearer the front of the mouth and the band therefore more objectionable if conspicuous. Suppose then that we have a bell-shaped bicuspid, with distal cavity well below the gum margin. The margin of the band is first festooned so as to cover the distal cavity margin when in place. Secondly, the band is cut away as much as possible without destroying its strength, along the labial aspect, forming it much in the shape of an open-faced crown. The band should be left as wide as possible on the lingual side, thus affording more attachment surface for the cement. Such a band may be forced with difficulty over the greatest diameter of the natural tooth and then be rather loose when forced to place. The edge of the festooned part of the band should be everted as described for the molars. This not only makes a better fit, and presents a beter surface to the gum, but likewise stiffens the edge. The cement is placed in the band, and the band forced to place. A stout burnisher is now placed against the free margin of the band where it crosses the cavity, and the band, or rather that part of the band, is forced distally. This will draw the band more tightly against the smaller neck of the tooth and tighten the fit of the band sufficiently so that when set the cement will hold the band in place. This likewise affords a better view of the interior of the cavity."

AT THIS POINT MY friend allowed me to depart. He paid for my Pie, too. So I gained something after all. 1916.

COMMENT. The method of using a band on teeth to facilitate the application of the rubber dam will be found first mentioned in Table Talk No. III. As above recounted, later on Dr. Callahan, and very likely others "discovered" the same method, except that Dr. Callahan recommended continuous copper bands, which can be purchased in assorted sizes from the dental goods dealers.

THIS IS NOT ONLY more convenient for the dentist, since it is much easier to select a tight fitting ready made band, than to take a measurement of the tooth and accurately solder one to fit. But there is yet another advantage in using ready made bands.

THE TECHNIQUE describes trimming the band narrow at all points except where the band is to cover the gingival margin of the cavity. But sometimes the cavity is so far under the gum margin, that such trimming would leave the rest of the band too narrow. In such cases select two bands of the same circumference, and cut one in half. One-half of the cut band is then easily fitted along the lower edge of the uncut band, preferably just within it, and is united with soft solder. This soldered extension may then be trimmed narrow enough to just reach across the cavity from the lingual to the buccal margin; and long enough to extend down to, and over the gingival cavity margin.

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MUCH EXPERIENCE with this method has taught the writer how to overcome certain difficulties that may arise. For example, some teeth may be so constricted at the neck that a band could not be burnished tight. In such conditions burnish the margin of the band along the buccal surface of the tooth, first drawing the burnisher mesially, and then pushing it distally. This will produce a slight wrinkle in the band. Remove the band, and cut a slit in this wrinkled place. Replace the band and again burnish, this time lapping the edges of the slit. In removing this band the slit will open of course, but when replaced with cement, and reburnished, an accurate adaptation along the gum margin will be easily obtained. Likewise such a band is more firmly held in position.

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IN SETTING THESE bands it has been recommended to press the cement inside of the band down against the gingival cavity margin, thus making that joint water-tight. This often has proved a bothersome bit of technique. If the burnisher was used against the cement too soon, it would adhere and drag the cement away. A moment later the cement might be too hard for satisfactory manipulation.

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INDEED THE VERY BEST RESULT is obtained by packing the cement against the gingival margin, while it is yet of a "sticky" consistency. Of recent years I have found it easy to do this, by using a large ball-shaped, or egg-shaped burnisher, liberally coated with vaseline.

1928.

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XX.

A FRIEND IN West Virginia writes as follows: "Kindly advise what you would do in the following case: Mrs. G., age about 25, married, one child 15 months old. She is small, nervous and rather anemic. Presented for extraction and bridgework. Administered N_2O and O on July 4, 1915, which she took badly, with considerable vomiting. Extracted two teeth. On July 12 applied arsenic to L.L. 2nd B.C. and L.L. 2nd M., and on the 15th remove the pulps without much trouble. Patient returned in a few days with slight soreness in molar, but I was enabled to fill the canal of the bicuspid, as there was no apparent soreness in it. Changed treatment in the molar, using ———. Patient returned in about a week—molar still somewhat sore; also bicuspid sore to percussion. Treatment changed in molar and counterirritants used over roots of both. Patient returned in a few days with swelling in region of the apex of the bicuspid; molar still sore. Opened the canal of the bicuspid and made treatment of Caulk's cresolform. As there was a bridge to be placed in the upper jaw, it was necessary to devitalize the pulp of the upper left 2nd bicuspid. Arsenic was applied and the pulp removed as usual. This tooth also became sore. I have changed the treatments every few days constantly until the present time, but am unable to overcome the soreness in either of the three teeth. Patient says she had about the same trouble with the upper left second molar, which she had treated about three years ago; says the dentist treated it for nearly a year, finally filled it, but that it still becomes sore at times. I have about reached the end of my rope, and would appreciate suggestions on the above case."

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THE DASH IN THE ABOVE replaces the name of a root canal nostrum, none of which should be used. It is bad enough to be responsible for the effects of known drugs, without risking the patient's health and our own reputation by resorting to quack cure-alls.

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IT IS NOT EASY, and often it is very unwise to attempt advice by correspondence, without opportunity to see the patient. In this case, however, as described, it is very clear that this patient is peculiarly susceptible to arsenic. Not only did the present attendant produce

❖ a pericementitis in every tooth so treated, but the patient reported
❖ a similar experience with a previous practitioner. ❖ ❖

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DEVITALIZATION OF PULPS with arsenic is a dangerous and bar-
❖ barous method, which should be resorted to only as the very last
❖ expedient, if ever. Moreover, if used at all it should be used with
❖ the utmost precaution, and in the smallest doses. Dear old Dr.
❖ Flagg used to state the dose thus: "Take the minutest possible
❖ quantity and use about one-third of that." ❖ ❖

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IN A CASE RECENTLY SEEN, the arsenic had escaped from the cavity
❖ and had destroyed the gum, producing a painful and angry ulcer.
❖ In the presence of such a condition the operator is almost helpless.
❖ Arsenic is self-limiting, which also means that it will run its course
❖ in spite of any antidotal remedy used. In this case, after all gum
❖ irritation had subsided, a part of the alveolar process was removed.
❖ This was arsenical necrosis, and the bone exfoliated was the
❖ sequestrum. ❖ ❖

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IF BY USING TOO GREAT a quantity of arsenic, and then perfectly
❖ sealing it in so that it cannot escape from the cavity, we should pro-
❖ duce this, or a similar condition, about the apex of the tooth, is
❖ there any wonder that the tooth should be sore, or that the dentist
❖ treating it should "reach the end of his rope?" ❖ ❖

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PERHAPS THE ONLY CURE short of extraction would be to reach
❖ "the end of the tooth." Surgery is the only radical remedy. If a
❖ condition of necrosis has been created it may require years for
❖ Nature to take care of the sequestrum, if it ever can be cared for
❖ short of surgical curettage. ❖ ❖

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APPROPRIATELY AFTER THE ABOVE we may consider the follow-
❖ ing from a brother in Freeport, New York. He writes: "Kindly
❖ advise me as to what means you use to alleviate the pericementitis
❖ that so often follows the removal of a pulp by pressure anesthesia?"

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THIS GENTLEMAN writes as though it were a common occurrence for a
❖ pericementitis to follow removal of a pulp by pressure anesthesia. In
❖ truth, it is a very uncommon occurrence. So uncommon that it
❖ may almost be looked upon as a sequence of erroneous technique.

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IN THE EARLY days of pressure anesthesia, this pericementitis was not
❖ only a common, but an all too frequent experience in my practice.

❖ At that time I was using a tablet of cocain and adrenalin. After ❖ much wrestling with the problem, I made a discovery. Instead of ❖ the usual medicated dressing, I tested out a theory, by dressing the ❖ canals with absolutely dry, sterile cotton. Immediately I ceased to ❖ have pericemental irritations, but in many cases upon opening the ❖ canals I found the cotton tampons saturated with blood. ❖ ❖

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THESE EXPERIENCES convinced me that it is a mistake to use adrenalin ❖ in connection with pulp anesthesia. It is pleasant to operate in a ❖ bloodless field, but it is not so pleasant for the patient to report next ❖ day with a pericementitis. My view is that the adrenalin being a ❖ vasomotor constrictor acts upon the capillaries temporarily. These, ❖ however, are gorged, and later, when the action of the adrenalin ❖ wears off, a hemorrhage supervenes. In this condition, if the canal ❖ is filled with cotton saturated, as it usually is, with an essential oil, ❖ there is no escape from the accumulation of a blood clot about the ❖ apex of the teeth. If this is not infected, no serious ill will result ❖ beyond a few days' discomfort. But, unfortunately, a bacterial in- ❖ vasion may easily reach this inviting pabulum, and an acute abscess ❖ may follow. ❖ ❖

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ALL THIS may be avoided by omitting all use of adrenalin, or any other ❖ styptics. Indeed, copious hemorrhage at the time of the operation ❖ is to be encouraged. Even after the bleeding may seem to have ❖ ceased, it may frequently be started again by the use of sterile paper ❖ cones, which, acting by capillary attraction, may be used to draw off ❖ more blood. Take plenty of time and permit the capillaries to empty ❖ themselves as much as possible. Then dress the canal with dry ❖ sterile cotton. It is all a matter of technique. 1916.

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COMMENT. The above was written, as dated, in 1916. Since that time ❖ I have removed pulps under pressure anesthesia in hundreds of cases, ❖ and have never had a single instance of pericementitis—"sore tooth." ❖ Apparently the theory that there should be no adrenalin used in ❖ the anesthetic is sound. 1928.

XXI.

THE ETIOLOGY OF SYSTEMIC DISEASE has been greatly simplified in recent days. Formerly a toeache was just a toeache, and you went to a chiropodist. Now the wise doctor tells you quite seriously that a toeache is a toothache, and he sends you to a dentist. The various stomach troubles, of course, are directly attributed to diseased "stomach" teeth, and iritis and other eye troubles can easily be cured by extraction of your "eye" teeth. Verily one wonders sometimes whether those medical gentlemen have "cut their own eye teeth," or whether their "wisdom teeth" may not be impacted, and thus not "working" well.

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THE EXTREMIST, OF COURSE, is found riding every new hobby-horse that is bred on the medical, or dental farms, but whilst I deprecate this style of taking exercise, I do not wish it to be understood that I think you should still be traveling in stage coaches when the trolley and the automobile are both so handy.

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I DO NOT BELIEVE that all the diseases attributed to the teeth are really caused by diseased teeth.

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BUT I DO BELIEVE that diseased teeth cause many systemic diseases that have their inception in foci of infection.

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I DO NOT THINK the medical interne should order the wholesale extraction of human teeth merely because some self-elected specialist in radiodontia, or radiography, or even rontgenology, marks a few shadows on a film picture with ink arrows. These arrows are always pointed, but they do not invariably point to the truth.

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ON THE OTHER HAND, I do think that when the internes recover their sanity and begin referring patients with doubtful teeth to supposedly competent dentists, the dentists should really be competent; competent enough to decide upon extraction of teeth which are really factors in systemic ailments, and which are probably incurable. Competent, too, to cure those infected teeth which are curable.

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IT HAS THEREFORE SEEMED timely to communicate with some of our men who are really competent, and to present in this department a symposium of their views. To this end the following letter was sent out:

"MY DEAR DOCTOR:—Nowadays a good deal is being said about the cure of alveolar abscesses by so called 'ionization,' but probably 999 dentists out of 1,000 are undertaking to cure 'abscesses' by other means. Will you kindly let me describe a specific condition and will you outline to me the treatment, aside from ionization, and aside from root amputation, which you think might be effective?

"WE FREQUENTLY FIND a tumor-like mass of tissue adhering to the ends of extracted teeth. This, nowadays, is called a 'granuloma.' Sections of these dental granulomas have recently been published (Eisen & Ivy, 'Dental Items of Interest,' February, 1916; and Thoma, 'Journal of the Allied Dental Societies,' March, 1916). Both of these authors, as well as a prominent German writer, who made similar announcement some two years ago, describe this tissue in quite similar language. Briefly stated, there is a central mass of granulation tissue (young connective tissue) surrounded by a more or less dense mass of old connective tissue. These granulomas are outgrowths from the pericementum. They are sometimes accompanied by purulent discharges through a fistulous opening, but quite often they are non-purulent in character. Suppose that such a condition exists at the end of a root, which either contains a dead pulp, or an imperfect root canal filling. Presumably, your treatment would first entail a thorough cleansing, and, as far as possible, the sterilization of the root canal.

"THE SPECIFIC QUESTION which I desire to ask is, can this pathological growth at the end of the root be eradicated? If so, kindly tell me, first, how would you treat the non-purulent variety, and will you please outline to me the sequence of events which would follow your treatment in producing the cure; that is to say, will you tell me how the growth is gotten rid of? Secondly, will you answer the same questions where the growth has become purulent and a fistulous opening has been established? Finally, is there a limit in either case to the possibility of curing by medication? To sum up, the general query is, in the presence of a granuloma, are there any medicaments which can be relied upon to remove the growth and have the apical area which it had occupied refill with healthy tissue, either soft or hard? If so, please outline the physiological stages of this reconstruction process."

DR. I. N. BROOMELL replies as follows: "I am not willing to admit that these growths are 'granulomas,' as a primary condition, because if they are ever deserving this appellation, it is only as a secondary condition such as follows the healing of an acute, or a chronic abscess, and as such they exist as scar tissue and not as an active pathological lesion. Such a neoplasm as a granuloma does not possess a pyogenic membrane, and is therefore not capable of purulency. If such growths as you describe are found attached to the root apices and are purulent, I see no reason to believe them anything else but periapical or alveolar abscesses, and as such they should be treated therapeutically by the direct application of pus destroying medicaments, or, if this proves unsuccessful, amputation of the root apex if too much surface is not involved. In brief, I mean to say that a dental granuloma, so-called, can only follow an active abscess, and represents connective tissue of repair. It is always non-purulent and harmless, and there is no more need to attempt to eradicate it than there is to remove or eradicate cicatricial tissue in any other part of the body."

DR. EDMUND NOYES writes: "I am doubtful if I can give any very satisfactory answer to your questions about granulomas. The conditions and locations in which they may occur differ very greatly, and the treatments and results will differ correspondingly. The non-purulent variety, in the absence of any sinus, and in the absence of any systemic conditions that seem to require a search for some focus of infection, I would think might remain undiscovered. If discovered, I believe but little more can, or need be done than thoroughly to sterilize and fill the root canal. If a cure is effected at all it must be done through tissue activity, and that is more likely to be retarded than helped by the action of strong antiseptics, or disinfectants, or escharotics.

"IF THERE IS A SINUS and purulent discharge, the first step would be to sterilize the root canal, and then the cure may be hastened by washing the sinus through the root of the tooth, if the foramen is large enough. If a strong antiseptic, or escharotic is used in the sinus, it should be used but once, and it is very probable that the cure is retarded by such an application instead of hastened. The limitation of successful treatment by medication, or perhaps I should say by the sterilization and filling of the root canal, is the extent to which the apex of the root has become denuded of its peridental membrance. The cementum of the denuded portion will become infected so deeply as to prevent it from becoming encapsuled."

TO THE ABOVE I SENT the following reply: "I thank you very much for your communication in regard to the treatment of apical abscesses. I am peculiarly interested in the last paragraph of your letter, where you say, 'The limitation to successful treatment by medication, or perhaps I should say by sterilizing and filling of the root canal, is the extent to which the apex of the root has been denuded of its peridental membrane. The cementum of the denuded portion will become infected so deeply as to prevent it from becoming encapsuled.' I am more particularly interested in the fact that you then wrote, 'Though it seems to me possible that this may sometimes happen.' This you then erased. May I ask you one question in regard to this? Dr. Grieves has made the point that it is bad judgment to allow chloropercha to escape through the end of the root because by this means the encapsulation of the end of the root by new growth of cementum is prevented. This position, taken by Dr. Grieves in a paper read before the New York State Dental Society last year, explains my interest in the line which you have erased. May I then ask you a direct question? I am entirely in agreement with you that if the peridental membrane has been destroyed at the end of a root, thus exposing the cementum, this exposed surface of the cementum may become infected. We know also that it may become roughened by absorption, necrosis, or whatever the process may really be. In such an event, after sterilizing as thoroughly as one may be able to do, will it not be of benefit to overflow this roughened or denuded end with sterile chloropercha?"

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DR. NOYES ANSWERED THUS: "Yours of May 1st is just received. First about Dr. Grieves's 'Encapsulation of the end of the root by new growth of cementum.' That process would not be encapsulation, as I understand the term. Growth of new cementum would not be accomplished if the root were denuded of its peridental membrane, since that membrane is essential for the growth of cementum, in a similar way as periosteum is necessary to the formation of periosteal bone.

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"AS TO THE PROTECTION of a denuded and roughened root-end with chloropercha, I do not believe it could be expected to succeed for long. I do not believe it possible to sterilize completely such denuded cementum, and besides the technical difficulties of accomplishing such an operation with certainty and definiteness, I do not believe that chloropercha, after the chloroform has gone out of it, will seal over infected cementum tightly enough to prevent the escape of infection through it."

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DR. J. F. BIDDLE WRITES as follows: "The line of demarcation between a tooth with an apical abscess which can be cured, and one which cannot is often very slight, and the condition requires a most careful diagnosis. To my mind, a root associated with a granuloma of long standing, or one denuded of its peridental membrane, is ordinarily beyond medicinal aid in so far as a cure be concerned. The granuloma at the apex of the root is the result of an abscess and must at some time have been infected; hence the question of purulency would not modify the treatment.

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"A ROOT WITH A HISTORY of a recent abscess, where the granuloma has not had sufficient time to become hard and dense, may be overcome by 50% sulphuric acid forced through the root and sinus. If a sinus be not present, one may be quickly established by artificial means and the above result attained. The sulphuric acid treatment is now followed by at least two ounces of normal salt solution (syringed under pressure), which throughly irrigates the canal, the cavity at apex and the sinus; the sulphuric acid cauterizes the tissue, the salt solution removing the débris, after which the physiological function of the cells proceeds to reconstruct the tissues at the apex of the root. If this be not accomplished, resection of the root, or extraction, should follow.

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"I DO NOT BELIEVE it is possible to cure an alveolar abscess of long standing where a large granuloma has formed and a great area of peridental membrane has been destroyed, except by surgical interference, and the sooner we, as a profession, resort to the knife, the bur and the curette, giving Nature a chance to step in and assist us, the sooner we shall attain better results. While I believe we all recognize the value of some medicinal agents, we are prone to greatly overwork this field, and in many instances have lowered the resistance of the apical tissues to combat conditions resulting from a putrescent pulp, rather than stimulated them."

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DR. J. P. BUCKLEY WRITES: "In your letter you start out by saying that 'nowadays a good deal is being said about the cure of alveolar abscesses by means of ionization, but probably 999 dentists out of 1,000 are undertaking to cure "abscesses" by other means.' Personally, I would have liked the statement better had you omitted the word 'undertaking.' This might be interpreted as meaning 999 dentists out of every 1,000 are undertaking to cure alveolar abscesses by means which will not effect a cure, or that the only cure for an alveolar abscess is the 'so-called' (I use the word advisedly) ionization method. If your statement is thus properly interpreted, it is

not correct; for dental granulomas and alveolar abscesses are being cured every day by dentists who have never used ionization, so-called.

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"BEFORE OUTLINING THE METHOD which I generally follow in treating these conditions, let us briefly consider the ionic theory. Ionization in chemistry means the dissociation of the ions (radicals) of a salt, or compound, as it passes in solution, or by means of the electric current. The men who have been attempting to cure, and I want to say that in many cases they do cure, a dental granuloma, or alveolar abscess, by dissociating the ions of certain salts, notably zinc chlorid, with the electric current, have been taught by Doctor M. L. Rhein, the most ardent advocate of this method, and so far as I know the originator of it for this purpose, that results are obtained by virtue of the infected tissues in the area being sterilized by the so-called ionization.

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"AT THE RECENT TRI-STATE meeting held at Kansas City in March, Doctor Weston A. Price made the statement that he had aspirated in many cases after using the current by Dr. Rhein's method, and that he could nearly always produce a culture from germs thus taken from the area supposed to have been sterilized. The aspiration was done immediately after the current and salt solution were employed. This does not prove that we cannot cure these conditions by this method. Doctor Rhein, himself, and others have proved conclusively that such conditions can be so cured; but it does prove that the results are not obtained by complete sterilization. Doctor Price further makes the statement that ionization, as such, cannot be accomplished in the manner explained by Doctor Rhein, and he (Doctor Price) thinks that what is really done by the current in these cases is cauterization of the affected area. The point I want to make is this: If cauterization of the tissues will effect a cure in cases of dental granulomas and alveolar abscesses, as I and many others know it will, the proposition resolves itself into the question: 'What is the most practical and effectual means of bringing about cauterization?'

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"FOR YEARS I HAVE ADVOCATED and successfully used phenolsulphonic acid for the purpose of cauterizing the area involved in dental granulomas and alveolar abscesses, and at the same time stimulating the tissues surrounding the area to healthy activity. There are many other chemical agents which may be used as cauterants in these cases; but I know of none, except perhaps trichloracetic acid, whose stimulating effect is equal to that of phenolsulphonic

❖ acid. It would be hard to prove along theoretical lines the truthfulness of this statement; but I have arrived at this conclusion after using all chemicals suggested for the purpose and after many years of close clinical observation. The other agents which may be used in these cases are the following: Sulphuric acid, 30% (Callahan); trichloracetic acid, 15% (Harlan); sodium dioxid (Kirk and Hodgens); potassium hydroxid (Pruyn); and also the caustic alkalis, potassium and sodium hydroxid, resulting from the use of the alloy potassium and sodium, as advocated by Rhein. In fact, I believe the cauterant effect of these alkalis has more to do with the results of Doctor Rhein's treatment than does his so-called ionization. ❖ ❖

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"WITH THIS PRELUDE, which I have felt is important, owing to the interpretation which might be placed upon your initial statement, I will attempt to answer your queries. In a large percentage of cases this pathologic growth at the end of the root, may be eradicated by the proper use of cauterants. Much, of course, will depend upon the extent of the destruction of the pericemental membrane and the consequent amount of denuded root-end as a result of the granuloma. As stated above, for years I have used phenolsulphonic acid for both the non-purulent and the pus discharging varieties. It is only recently that these non-purulent growths—dental granulomas —have been recognized as such; and the treatment of such conditions has not been as specifically emphasized as their significance deserves. ❖ ❖

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"NON-PURULENT VARIETY.—It makes no difference with me whether this growth is associated with a tooth, the canal of which contains a gangrenous pulp, or an imperfect root-canal filling—the treatment is practically the same. At the first sitting, when the diagnosis is made by the aid of a radiograph, under aseptic precautions, the pulp chamber is opened into freely and a dressing of formocresol is hermetically sealed in for two or three days. This is for the purpose of neutralizing the gangrenous contents of the canal, or in a measure sterilizing the old root filling, as the case may be. If one should attempt to work his way by chemico-mechanical means to, and through, the involved root-end without the previous application of some strong disinfectant, like formocresol, I have found that acute symptoms too frequently develop. This previous formocresol treatment prevents much of the acute symptoms which follow the immediate attempt to reach the root-end, however careful one may be. ❖ ❖

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"AT THE SECOND SITTING, with the rubber dam always in place, I

carefully work to the apex with phenolsulphonic acid, using in connection therewith smooth, twist and file broaches. This is what I call the 'chemico-mechanical' process. The acid is frequently neutralized by a solution of sodium bicarbonate. The effervescence not only neutralizes the acid, but it materially aids in removing the 'mushy' and disintegrated material from the canal. After I am satisfied that I am to the end of the root, and the acid is neutralized and the canal perfectly clean; then, with the acid and small twist broach, I work my way through into the affected area. Some of the acid is purposely worked through the end for the express purpose of destroying the growth by cauterization.

"IN MY BOOK I have spoken of phenolsulphonic acid as a stimulating cauterant and called it 'a bone cell stimulant,' and I am still of this opinion. Personally, I have obtained better results by using this agent than with any other cauterant at my command. When this is accomplished, the acid in the canal—not that which has passed through—is neutralized with the sodium bicarbonate solution, the canal desiccated with 'modified alcohol' (70% alcohol to which one grain of thymol is added to each fluid ounce) and a dressing of phenol compound, or eucalyptol compound, preferably the latter (very little of the remedy on the cotton), is sealed in the canal. This is left for a period of from four days to a week, when, if the case has progressed nicely, and pericementitis is absent, the canal or canals are filled.

"WHAT BECOMES OF THE GROWTH and tissues that were cauterized? I do not know; but I do know that Nature disposes of them in some way, for under the above treatment bone and tissue regeneration is effected. If the root-end can be put and kept in such condition that the surrounding tissues can lie in physiologic contact with it, regeneration is effected; if this biologic condition cannot be brought about, all medication fails and surgery is the only road to success.

"PURULENT VARIETY.—The treatment of an alveolar abscess of the purulent, or discharging variety is practically the same as previously outlined, except that in these cases there is not the danger of the acute symptoms arising; therefore one may safely, under aseptic precautions, work to and through the root-end without the initial formocresol treatment. After we are through the end of the root it is best first to force a physiologic salt solution through the sinus, and then cauterize the same with some cauterant. Here I also use phenolsulphonic acid, full strength, as was used above for reasons

❖ mentioned. After this my treatment is the same as previously given
❖ for a dental granuloma. ❖ ❖

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"I WILL ANSWER YOUR FINAL general query by saying that, in my
❖ opinion, there are certain medicaments which may be 'relied upon
❖ to remove the growth and have the apical area which it had occu-
❖ pied refill with healthy tissue, either soft or hard.' The treatment of
❖ a dental granuloma, or alveolar abscess is a biologic problem, and
❖ he who ignores biologic laws must expect a failure. When we learn
❖ to work with and not against Nature we will have taken a long step
❖ forward. What a dismal old world this would be if there were only
❖ one royal road to success in any line of human endeavor. ❖ ❖

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"I CONGRATULATE YOU on your general questions. I consider the
❖ treatment of pulpless teeth and the filling of root-canals the most
❖ important problem before the profession today." ❖ ❖

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DR. M. L. RHEIN CONTRIBUTES the following: "In 1893 I com-
❖ menced the use of zinc ionization for the eradication of pathogenic
❖ tissue in the periapical region, and since then my treatment of the
❖ diseased areas described in your questions has been confined to this
❖ therapy, supplemented by apicoectomy when the cementum of the
❖ root itself was diseased, or where, on account of anatomical reasons
❖ it was impossible to seal the periapical entrances of the various root
❖ canal foramina. ❖ ❖

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"FROM THE VERY OUTSET of the use of ionization, the clinical
❖ records of absolute success have been so remarkable that there never
❖ has been a case since 1893 in my practice where there has been any
❖ reason to revert to former methods. ❖ ❖

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"UNDER THE CONDITIONS SPECIFIED, it is essential before any
❖ attention is given to the eradication of any periapical infection that
❖ every vestige of organic matter be removed from the canals. After
❖ this has been done, under strict aseptic supervision, the pathologic
❖ tissue in the periapical region must be eradicated and all pathogenic
❖ microörganisms obliterated. ❖ ❖

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"PRIOR TO 1893, my custom was either to resort to apicoectomy (my
❖ favorite remedy at that time) or to use some powerful escharotic
❖ in the shape of some form of sulphuric acid, chlorid of zinc, etc., and
❖ to follow this by the injection through the foramen of five or ten
❖ drops of bichlorid of mercury, dissolved in Marchand's hydrogen

❖ peroxid, 1 to 500. Apparently many types of alveolar infection, ❖ especially incipient cases of alveolar abscess, were cured by this ❖ latter treatment. ❖ ❖

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"THERE HAS, HOWEVER, never been, to my knowledge, any radio- ❖ graphic evidence of alveolar regeneration following this treatment. ❖ Until such evidence has been submitted, it is permissible to be ❖ skeptical as to obtaining a genuine cure by such forms of treatment. ❖ Any corrective treatment must show, in a reasonable time, distinctive ❖ evidence of new alveolar structure, replacing any rarefied bone area. ❖ So far, this appears to be obtained only after efficient ionization, or ❖ the thorough use of the knife, in apicoectomy. ❖ ❖

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"FOR ANY SCIENTIFIC value to be given to any other forms of ❖ therapy, their advocates must be able to show radiographs of rare- ❖ fied alveolar structure, followed in due time by similar pictures of ❖ the same area with distinctive evidence of new alveolar structure ❖ filling up this rarefied area." ❖ ❖

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DR. RHEIN'S DEMAND is just. Those who cure granulomas with sul- ❖ phuric acid or other medicaments should publish a few radiographs ❖ of their cured cases. I have seen only one authentic radiograph of ❖ such a cure. ❖ ❖

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ONLY YESTERDAY I WAS called to the telephone. The voice of a ❖ dentist spoke as follows: "Doctor, I am sorry to interrupt you, but ❖ may I ask you just two questions? Is ionization effective in treat- ❖ ing abscesses? What apparatus do you recommend?" Just two ❖ simple little questions like that, with a patient in the chair! "My! ❖ Oh, My!" ❖ ❖

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BUT I AM RECEIVING letters constantly asking the same two ques- ❖ tions. One I will answer definitely at once. I cannot conscientiously ❖ recommend any special apparatus, because I have not used them all. ❖ Moreover, I do not wish to advise anyone to invest in any apparatus ❖ for ionization until I am myself convinced that ionization is the most ❖ reliable method of treatment. In this symposium the followers of ❖ these Table Talks will have before them the quotation from Dr. ❖ Price reported by Dr. Buckley, together with Dr. Rhein's views. To ❖ this will now be added a few extracts from an article by Dr. J. Polack, ❖ which recently appeared in the "Australian Dental Journal." ❖ ❖

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THE FOLLOWING are excerpts from Dr. Polack's article: "The whole ❖ principle of electric therapeutical treatment is based on the penetra-

❖ tion of ions into the tissues of the body by the action of an electric ❖ current on a solution of some drug. This solution is known as the ❖ electrolyte. The most useful salts for our purpose are those of zinc ❖ and copper. The effect of the current on solutions of zinc chlorid, ❖ or copper sulfate, is such that the metallic radical is separated and ❖ driven into the tissues, whereby the organisms are effectively de- ❖ stroyed and the tissues stimulated to repair. Ledere says, 'The zinc ❖ ion is an antiseptic of the first value, and when applied electrically ❖ it can be made to penetrate the skin to any desired depth. There ❖ is no wound or ulcer which cannot be disinfected by its employment, ❖ provided its surface can be reached by the electrodes. One of its ❖ peculiarities is that it provokes but little inflammatory reaction. ❖

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"IT IS NECESSARY TO KNOW which ions are electro-positive and ❖ which electro-negative. Metals, alkalis, hydroxyl and alkaloids are ❖ electro-positive. Acid radicals, sodium, bromine are electro-nega- ❖ tive. This is important, for if we wish to ionize tissue, say, with ❖ $ZnCl_2$, we must apply the positive electrode with the electrolyte to ❖ the area of operation. If we were to reverse and apply the negative ❖ pole, we might get destruction of tissue instead of stimulation, and if ❖ sufficient current be used we could do no small amount of damage. ❖ In ionic medication it is advisable to dissociate a particular ion and to ❖ depend on that ion for the therapeutic action desired. If we are ❖ using $ZnCl_2$ to procure Zn ions, use a Zn electrode. ❖ ❖

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"FOR ALVEOLAR FISTULA a copper electrode is recommended. The ❖ copper is placed along the whole tract to the source of the trouble. ❖ After the current has passed for about five minutes with a current ❖ carrying from 3 to 5 m.a., it will be found that the electrode has ❖ adhered to the soft tissue. Reverse the poles for about one minute ❖ and it can be easily withdrawn. One or two such treatments will ❖ cure chronic sinuses which have hitherto defied all medication. ❖

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"AS AN AGENT IN STERILIZING ROOT CANALS, there can only ❖ be one verdict—that ionization of zinc chlorid is the best method ❖ at our disposal. A fine platinum or steel broach, with some cotton ❖ wool soaked in a five per cent. $ZnCl_2$ solution and introduced into ❖ all canals before filling, will ensure an absolutely aspetic canal filling. ❖ The zinc ions will penetrate the dentinal tubules, and any escaping ❖ through the apex will not irritate, but if anything stimulate and steril- ❖ ize to perfection; in fact, the whole tooth structure could be saturated ❖ with zinc and ensure no after-trouble." 1916.

卐————卐

COMMENT. The above should be of interest to all students of this

❖ subject, and especially undergraduate students, because here we ❖ find recorded the views that were prevalent in the year 1916, and ❖ which, despite the dissimilarity of the beliefs and theories of the ❖ several authorities, are just as prevalent today. ❖ ❖

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I DO NOT INTEND to express my own present views on the question ❖ "What is a granuloma." But I would call especial attention to the ❖ opinion voiced by Dr. Broomell, that what is now called a "granu- ❖ loma," is a secondary condition, such as follows the healing of an ❖ acute, or a chronic abscess, and as such exists as scar tissue and not ❖ as an active pahological lesion." ❖ ❖

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HE FURTHERMORE SAYS "—there is no more need to attempt to ❖ eradicate it than there is to remove, or eradicate scar tissue in any ❖ other part of the body." ❖ ❖

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NEVERTHELESS IT IS an established fact, that a granuloma produces ❖ a radiolucent area in a radiograph, and that any such "spot in the ❖ picture" invariably dooms the tooth to extraction, if judged by the ❖ radical element in the dental and medical worlds. ❖ ❖

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PERSONALLY I DOUBT that a granuloma is a secondary condition to ❖ an abscess. I rather am of the opinion that the majority of granu- ❖ lomas occur on roots that never have been affected by an abscess. ❖ But, my own opinion cannot be accepted as final, because there are ❖ just as many who account a granuloma as a virtuous tissue, as there ❖ are who call all granulomas vicious. ❖ ❖

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THE WORD IONIZATION occurs frequently in the above Table Talk ❖ and perhaps should be abandoned, as it is not strictly correct as it ❖ was used in those days, and indeed is still used. It would seem ❖ more accurate to speak of "electrolytic medication," but at the ❖ moment I am less interested in the terminology than in the effects ❖ of electrolytic medication. ❖ ❖

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AS DR. BUCKLEY CORRECTLY states, Dr. Rhein, the originator of the ❖ method, claimed that by "ionization" he sterilized the area of infec- ❖ tion. It is only fair, however, to call attention to the fact that in his ❖ contribution to the symposium under discussion, his statement was ❖ more cautiously worded. He tells us: "In 1893 I commenced the ❖ use of zinc ionization for the eradication of pathogenic tissue in the ❖ periapical region." ❖ ❖

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LATER HOWEVER he states that—"the pathologic tissue in the periapi-

❖ cal region must be eradicated and all pathogenic microörganisms
❖ obliterated." ❖ ❖

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THAT A REGION of infection in the alveolar bone can be sterilized, is
❖ a theory that never did appeal to me as sound; hence I doubted
❖ this doctrine from the time when it was first promulagted. Yet we
❖ find Polack claiming that "the effect of the current on solutions
❖ of zinc chlorid, or copper sulfate, is such that the metallic radical
❖ is separated and driven into the tissues, whereby organisms are effec-
❖ tively destroyed and the tissues stimulated to repair." ❖ ❖

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POLACK QUOTES LEDERE as saying that "the zinc ion is an anti-
❖ septic of the first value, and when applied electrically it can be
❖ made to penetrate the skin to any desired depth. There is no
❖ wound, nor ulcer which cannot be disinfected by its employment,
❖ provided its surface can be reached by the electrodes." ❖ ❖

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IT IS POSSIBLE that the last proviso made by Ledere may account for
❖ the totally different views adopted by myself after experiments that
❖ will now be recorded, because it is practically impossible to reach
❖ the granuloma with the electrode. ❖ ❖

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AS ALREADY STATED I doubted the claim that the apical region,
❖ when infected can be disinfected or sterilized, or all microörgan-
❖ isms destroyed by electrolyptic medication. To test this theory,
❖ with the assistance of Dr. Adolph Berger I carried through a series
❖ of experiments, as follows: ❖ ❖

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I SHOULD ALSO MENTION that I had very material aid from Dr.
❖ Frank T. Van Woert, who constructed for me an ingenious appara-
❖ tus with which I could apply electrolytic medication out of the
❖ mouth. At the base of a small stand there is a small glass pipette
❖ in which has been fused a platinum wire. Rising perpendicularly
❖ from the base is a rod, into which another rod telescopes, and from
❖ this an arm extends horizontally, with a clamp for carrying an
❖ electrode. ❖ ❖

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WHENEVER A TOOTH was extracted at Dr. Berger's clinic, which
❖ brought with it a granuloma of any considerable size, Dr. Berger
❖ would drop the freshly extracted tooth into a glass tube filled with
❖ normal salt solution, and send it to me promptly. Such specimens
❖ often reached me within one hour. ❖ ❖

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NO SPECIAL EFFORT WAS MADE to avoid mouth contamination,

❖ though of course ordinary care was used. The point was, that we ❖ were to test the ability of electrolytic medication to destroy organ- ❖ isms on, or within a granuloma. The possible addition of a few ❖ mouth organisms during the removal of the tooth did not seem to ❖ be of importance. ❖ ❖

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UPON RECEIPT of such a specimen I would clip off the extreme lower ❖ end of the tissue, and drop it into a tube of bouillon, which was ❖ then placed in the incubator. ❖ ❖

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THE PIPETTE on the base of the apparatus made by Dr. Van Woert, ❖ was then filled with normal salt solution, and the tooth placed in the ❖ mouth of the pipette, with the granuloma immersed in the salt so- ❖ lution. The electrode was then wrapped with cotton and adjusted ❖ so as to enter the tooth cavity. In some cases a platinum electrode ❖ was used, in which case the cotton was saturated with zinc chlorid ❖ solution. In other cases, Rhein's method was followed. The ❖ electrode was of pure zinc wire, and the cotton was saturated with ❖ normal salt solution. ❖ ❖

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BY EITHER METHOD the "ionization" was kept up for half an hour ❖ with 1 milliampere of current. The current was then turned off, and ❖ a second particle of the granuloma cut off and dropped into a ❖ second test tube containing bouillon. This became "tube No. 2." ❖ The "ionization" was renewed for another thirty minutes, and the ❖ remains of the granuloma cut off and dropped into test tube ❖ "No. 3." ❖ ❖

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THUS, IT WILL BE SEEN that tube No. 1 became the control, and tubes ❖ 2 and 3 contained granulomatous tissue which had been "ionized" ❖ one for thirty and the other for sixty minutes, either being much ❖ longer than is customary in treatment in the oral cavity. ❖ ❖

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THIS SERIES of experiments was carried on, until twenty-eight speci- ❖ mens of granulomas attached to extracted teeth had been thus ❖ treated, and in no single instance was there any less growth in tubes ❖ 2 and 3 than in control tube, No. 1. ❖ ❖

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PROFESSOR HERMAN PRINZ, in his recently published Text-book, ❖ "Diseases of the Soft Structures of the Teeth and Their Treatment" ❖ (1928), suggests that "electro-sterilization" would be a better term ❖ than "ionization," and this may be true when the treatment is con- ❖ fined to surface lesions, but it is scarcely applicable to the method ❖ when it is used for the eradication, or cure of apical granulomas, be-

cause, as we have shown, sterilization, or the destruction of micro-organisms on, or within a granuloma cannot be accomplished in this manner. And it is for this reason that, in connection with treatment of periapical disease I prefer the term electrolytic medication.

PRINZ HIMSELF, in this same work, describes his experiments by which sterilization of root canals was accomplished. He made cultures from infected root canals, before treatment, and every five minutes thereafter during treatment, usually for twenty minutes. By this means he determined the length of time and the amperage needed to sterilize a root canal by "electro-sterilization." Later he makes this significant statement: "It should be borne in mind however that this type of sterilization means sterility of the walls of the root canals only, and not of the entire tooth root. To prove the correctness of this statement, which on its very face is self-evident, tooth roots Nos. 2, 3, and 4 of the experiments recorded in Table C, were cut into coarse shavings, plated on agar, and placed in the incubator. In twenty-four hours all three plates showed luxurious growth."

BOTH PROFESSOR PRINZ'S experiments and my own, would seem to indicate that the periapical space cannot be sterilized electrolytically. I should not be understood however as claiming that granulomas may not be cured by "electrolytic medication."

STILL WORKING with Dr. Berger, and with the further histological aid of Dr. Emily Schirmer, the experimentation was carried further. Teeth were "ionized" once, twice, and three times, a week between treatments. The apices were then resected with the granulomas still attached, and sections and microscopic examinations made. At some future time these experiments may be reported in full. Suffice it here to state that our opinion, after study, was that granulomas thus treated, show islands of necrosis; that these necrotic areas interfere with the nutrition of the tissue which becomes progressively necrotic. This condition invites removal by giant cells. The disturbance also causes an influx of phagocytes which attack the micro-organisms present. If the patient's vital resistance is good, the apical area is sterilized, not by the direct action of electro-sterilization, but by the normal fighting forces which are thus summoned to the region. The necrotic tissue is removed by giant cell action, and coincidently osteoblasts are activated to repair. When this syndrome occurs, the granuloma is entirely eradicated, and is slowly but surely replaced with new bone. Thus cures are effected by electrolytic medication, rather than by electro-sterilization. 1928.

XXII.

I HAVE A CONFESSION to make. I have made only a few gold inlays by the so-called indirect method. Of these, the majority were so unsatisfactory that I made them over by what may be called the direct-indirect method; or perhaps I should call it the indirect-direct method, because the direct part comes last. Let me be more explicit. Ninety-nine times in a hundred, I fashion my wax pattern with the rubber dam in place. Then comes the hundredth time, when I cannot apply the dam. Yes, my friend, I know that recently I said the dam can be applied anywhere, but we were talking about treating root canals. We can treat a root canal with a copper band around a tooth, but we cannot make a wax pattern for an inlay with such a band in place.

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SO ONCE IN A WHILE we find a tooth, usually in a very wet mouth, where we cannot successfully use the dam. In those cases I have tried the indirect method. But I have never succeeded in making the wax pattern, made from the mold, fit the cavity to my satisfaction. I do not mean that others cannot do it. I only mean that in that particularly difficult kind of case I cannot do it. But I have found it convenient to make such a pattern on a model, and then perfect that pattern in the mouth, because by this means we shorten the time of work in that difficult situation. This is what I mean by the indirect-direct method.

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THEREFORE IT IS EVIDENT that I have not been practicing the indirect method. Then when good men, and true, tell you that a perfect M. O. D. inlay cannot be made by the direct method, what is a fellow to think? If that be true, what sort of inlays have I been delivering to patients, anyway? You see we all are apt to be prejudiced in favor of our own work. We often see failures, bad work, etc., but that always come from the other fellow! Isn't it so?

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BUT ONCE IN A WHILE we awaken, or are awakened from this sort of trance and we wonder if our method is so good after all! At the fiftieth anniversary meeting in Chicago, one of my Western friends was showing how to make M. O. D. inlays that would fit. And here is the interesting feature. He was demonstrating with a model of

course. But remember this. Making a wax pattern for a cavity in a model, and casting the gold inlay from that, is practically the direct method so far as that model is concerned. The process is the same as making a pattern in a natural tooth, and then expecting the casting to fit the tooth. Consequently if a casting could not be made to fit a M. O. D. cavity in a model, neither could it be done in a natural tooth. And this gentleman's castings invariably did not fit his models. Then he would place the inlay in the cavity of the model and swage it to place. After which it would fit.

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FROM THIS THE CLINICIAN ARGUED that the indirect method is essential for M. O. D. cavities so that swaging could be done. Some time after that I received the following from Dr. J. P. Arnold of Houston, Texas:

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"AM SENDING YOU under separate cover, per insured mail, models and inlays used for my clinic at the Texas State Dental Association. The impression was taken in modeling compound and poured up in Spence's plaster, instead of using alloy or cement. There are two inlays; both were cast at the same time in the same investment, after which one was put on the model and swaged with a Coates swager. The one not swaged does not fit. The other does fit. The idea of the clinic was to demonstrate the amount of distortion that takes place when casting M. O. D. restorations and the difference after swaging them, which is a point in favor of the indirect method in this class of restorations."

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HERE WE HAVE THE SAME PROPOSITION. M. O. D. inlays must be made by the indirect method because they must be swaged to make them fit. Just after that I received the following pleasant little message in a letter from Dr. L. C. Burgard of Louisville. He writes as follows: "In large castings it seems to me impossible for anyone to cast an inlay made by the direct method that will have as accurate marginal fit as can be obtained by my indirect method. I can prove this, I think. My casting is done in a simplified manner with scientific accuracy."

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IN PASSING it may be said that anything that is done accurately, is done scientifically. Scientific is from the Latin—scio—to know. He who accomplishes anything with accuracy, must know how. But with men stating so positively that accurately fitting inlays cannot be made by the direct method, the fact that I am practicing the direct method only, has compelled me to ask myself: "Am I making accurately fitting inlays? Do I know?"

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NOT BEING ABLE TO ANSWER this to my own satisfaction, I concluded to ask some other men. I therefore sent the following letter to several:

"AMONG ALL THE PROBLEMS connected with the cast gold inlay, the M. O. D. inlay seems to be the most problematic. Quite a number of men claim that, because of the laws of expansion and contraction, a correctly fitting M. O. D. inlay cannot be made. The failures which have occurred with M. O. D. inlays might be attributable to so many and such various causes that the mere fact that a man has a failure does not to my mind prove the impossibility of making a success. For example, different men have different ideas of cavity preparation. They use different kinds of wax; some operate directly and some by the indirect method. Then many men using the same wax have used it differently and at different temperatures. Some perhaps form a cavity so that wax melted into it could not be withdrawn. These men of course can withdraw the wax which they press in, the wax however being distorted in the act. No reproduction of such a pattern would fit the cavity. Then we have many varieties of investment and many methods of investing. Also we have various notions about melting the wax from the mold. The whole process, my dear Doctor, offers so many different loopholes for error that failure is perhaps more to be expected than success.

"THE OBJECT OF THIS INQUIRY, therefore, is to get your present opinion on the main question. Can a M. O. D. inlay be cast to accurately fit a correctly shaped cavity in a human tooth? I would be very much indebted to you for an expression of your views on this subject with permission to publish the same together with the views of a few others to whom I am writing this same letter, all men who have a right to express an opinion because they have investigated the matter. It is my hope that by placing these views in juxtaposition we may sift out the facts from the theories."

THE FOLLOWING reply was received from Dr. C. S. Van Horn of Bloomsburg, Pa.:

"I HAVE YOUR INQUIRY: 'Can a M. O. D. inlay be cast to accurately fit a correctly shaped cavity in a human tooth?' Accurately, perfectly, exactly, etc., are relative terms conveying little, unless we have knowledge of the standard to which the individual—who makes the statement—works. Therefore, if, by the inquiry, you mean: Can a M. O. D. 24-K. gold inlay be cast to fit a like cavity in a

❖ human tooth 'in the mouth,' as accurately as a casting for a simpler
❖ type of cavity, my answer is: 'It can.' ❖ ❖

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"THE FIT OF A DENTAL GOLD INLAY, other things being equal,
❖ is dependent upon a recognition of well established physical laws.
❖ If we accept these laws to the full, our technique becomes standard-
❖ ized to the point where we recognize that so long as the tooth is in
❖ the human mouth (constant temperature), the type of cavity—
❖ O., M. O., D. O., or M. O. D.—is inconsequential in so far as the fit
❖ of the casting is concerned. ❖ ❖

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"ASSUMING THAT WE ARE considering conserving the human teeth,
❖ these laws demand: That the wax pattern—not impression—be
❖ made directly in the cavity; that the pattern wax be non-plastic at
❖ body temperature; that the pattern be made without stretching the
❖ wax, or if stretched, the resultant 'elastic property' (Price) of the
❖ stretched wax be neutralized; that the pattern be invested at a given
❖ temperature and that the plastic investing material and the invested
❖ wax pattern remain constant at the given temperature until the in-
❖ vestment is fully set; that less error will creep in by casting in a hot,
❖ than in a cold mold. All of the above technique, the reasons for
❖ its existence and adoption by the writer, together with the appliances
❖ for its easy execution have been fully described and illustrated in
❖ various issues of the 'Dental Cosmos.'" ❖ ❖

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DR. MARCUS L. WARD sends the following intensely interesting com-
❖ munication: ❖ ❖

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"I HAVE AT HAND your letter relative to the question of whether or
❖ not an M. O. D. cast gold inlay can be made to 'correctly fit,' and
❖ will say in reply that I am glad to enter into the discussion of the
❖ subject, because I feel that not only can it be done by the man of
❖ average ability in practice, but it can be done by students of dentistry
❖ with a comparatively limited experience in technical work. I have
❖ with me every year senior students who can make a compound cast
❖ gold inlay in a given tooth, and a gold foil filling in an adjacent
❖ tooth, with such clever work on the margins of the cavity, the wax
❖ pattern, and the finishing of the inlay or foil filling as the case may
❖ be, that the inlay cannot be told from the foil filling with the naked
❖ eye. As a rule, however, these students are usually above the
❖ average of the class in technical ability. I have with me and my
❖ associate, Dr. Cole, at this time, a senior student who has done our
❖ required technic work outside of the mouth and ten practical cases
❖ in the mouth, and has operated at the chair only since last October.

We have just dismissed him from further work as a student and told him to help us in the capacity of a demonstrator for the remainder of the year. I asked him yesterday what he thought of your query and he replied at once: 'Of course it can be done if the proper cavity formation and a good wax patern be obtained.'

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"HE WAS ASSUMING THAT constancy in temperature in handling the wax, and comparatively low temperatures for removing the wax, etc., had been followed. To this man, these two features appeared to stand out most prominently. I then submitted your query to Dr. Bailey, another man associated with me in much the same capacity as Dr. Cole, and he remarked, 'Certainly if they know the correct cavity formation.' The first thing that he thought of when the question of compound inlays was submitted was 'cavity formation.'

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"AFTER THIS I TOOK YOUR letter to Dr. Cole, who is most intimately associated with me of all our instructors. His customary smile for the discussion of the compound cast gold inlay appeared, and he began to enumerate some of the things that contribute to the possibility of making cast gold inlays 'correctly fit,' naming cavity formation first, then a wax pattern with perfect margins, the temperature at which the gold is thrown into the mold, etc., etc. In fact, there is no one around me who is not familiar with the claims of some of our good friends who construct the compound cast gold inlay in two parts, and they know that some of our best societies have had on their programs, clinics showing how to correct the cervical deficiency in compound cast gold inlays, and yet regardless of this knowledge they simply smile when asked if they can make one of these inlays fit.

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"I DO NOT BELIEVE it is possible to make a single operator in our clinic this year, or a single student from our school within the last five years, believe that a cast gold compound inlay cannot be made to 'correctly fit' without the use of mat gold at the cervical margin, or without constructing the inlay in two parts. Why? Because they have done it, and have seen their fellow students do it dozens of times on every tooth, from third molar to third molar, with both the direct and indirect method, and have complimented one another on the results.

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"FROM THIS YOU WILL note that we believe that a M. O. D. cast gold inlay can be 'made' to 'correctly fit' a cavity in a human tooth.

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"IN THE LATTER PART of your letter you raise a different question, in my opinion, when you ask if a M. O. D. cast gold inlay can be 'cast

❖ to accurately fit' a cavity in a human tooth. The former question
❖ allows the fitting to be done after casting and the latter does not,
❖ as I interpret your letter. ❖ ❖

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"WITHOUT THE FITTING of the inlay after it comes from the mold
❖ we are unable to construct the compound inlays that appear in our

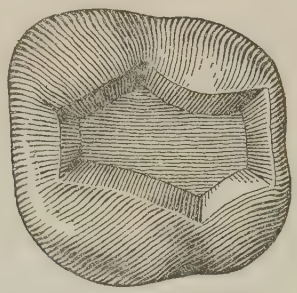

Fig. 1

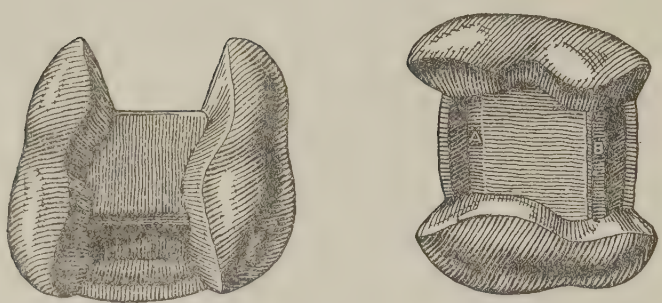

Fig. 2

❖ clinic, to the extent of from fifteen to thirty a day at this time of
❖ the year, so that they cannot be told from the foil fillings. ❖ ❖

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"WE CAN DO SOME of them, and we can do some of the more regular
❖ forms of castings that we have tried in the laboratory, but we can-
❖ not make the large number of irregularly shaped ones meet our
❖ standards without the fitting. We can expand the wax pattern in
❖ some cases and get a good result, and we can cast over a model,
❖ such as artificial stone in some cases, and get a good result; but if
❖ we apply either method to every case that is found in our clinic,

we do not get the result that we do if we apply a technique more like that to which you referred in your article in 'Dental Cosmos,' January, 1915, and carry out a cavity preparation similar to that represented in Fig. 2.

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"IN YOUR OWN PAPER you say that, 'success depends more upon a constancy and accuracy of technique than upon the utilization of any extraordinary means of overcoming faults which should not occur at all.' To the one who says that the compound cast gold inlay cannot be 'made to fit' this statement should be worth a volume of the literature that appears without an appeal for 'accuracy of technique.' This is fundamental. The wax pattern should be perfect, and should be chilled in the cavity, and immediately invested with water from the same glass as that used to chill the pattern. The investing material should be thoroughly mixed and revolved in the bowl to eliminate all the air possible. It should not be allowed to stand longer than is necessary to harden, before it is placed over a low heat to dry. The wax should be removed with heat below 800° Fah. The gold should not be heated beyond the point at which it can be made to completely fill the mold. The cavity should be so shaped that advantage may be taken of a taper, etc., etc. I am satisfied that a great many men do not practice such methods, so I am not surprised that the question is raised as to whether the cast gold compound inlay can be 'made to fit' or 'cast to fit.' They have allowed themselves to become convinced that some enormous warpage, or contraction of the gold had taken place, and have overlooked 'ordinary accuracy' in technique.

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"I HAVE SEEN MANY MEN make compound cast gold inlays that had crevices at the cervical margin large enough to be seen with the naked eye and which would allow a good-sized instrument to enter, and they believed that it was due to contraction of gold, when the actual contraction of the gold in these inlays was much less than the crevice would indicate. These inlays were not down in the cavity because they were shortened mesiodistally, not to the extent that the crevice would indicate, but possibly to a degree not visible to the naked eye. Therefore anyone who has inlays with crevices at the cervical margins that can be seen with the naked eye, and into which he can pass good-sized instruments, can rest assured that something has happened besides contraction of gold, for the contraction of gold that takes place in a molar gold inlay is visible to the naked eye, only under the best of light conditions.

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"IF GOLD FOLLOWS THE LAWS of physics of all the metals (except

❖ bismuth, which expands on cooling) and expands when heated and ❖ contracts on cooling, and if the amount of contraction is as much ❖ as is claimed by Dr. Price (2%), and if the approximal portion of a ❖ molar inlay should be ¼ inch from cervical to occluso-proximal ❖ margin the total shortening of the gold would be approximately ❖ 1/200 of an inch. ❖ ❖

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"THERE SEEMS TO BE no reason for us to doubt that gold expands ❖ when heated (probably in proportion to the heat) and contracts on ❖ cooling. Every test made for the purpose of determining this ❖ question with instruments in the physical laboratories confirms this ❖ view. Experience in practice with such cavities as delineated in ❖ Figs. 1 and 2, the first of which represents inside dimensions only ❖ to fit, and which is comparatively easy of accomplishment; and the ❖ second of which represents both inside and outside dimensions and ❖ is the most difficult of all to fit, also confirms this view. ❖ ❖

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"EXPERIENCE in practice with the cast base crown which has outside ❖ dimensions to fit, confirms this view. The same is true with castings ❖ of any size in bridgework, crown work, and about every place where ❖ casting is done. ❖ ❖

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"THERE IS, IN MY OPINION, some doubt that the contraction of gold ❖ is quite as high as it has been placed by Dr. Price ('Items of In- ❖ terest, 1908), first because the tests were made on bars of gold, ❖ which, if they follow the same laws as bars of other metals, are ❖ more free to contract than spherical castings; and second, because ❖ he has not given the exact temperature at which he filled the mold ❖ with gold. This latter phase of the subject is one of much practical ❖ value in my opinion. It is essential that the gold be fluid enough ❖ to fill the most remote parts of the mold but, if the pressure is de- ❖ livered quickly, it is not necessary to boil the gold as some believe, ❖ to get it into every part of the mold, even in irregular shaped cavities. ❖ Our more recent work has impressed us with this view of the situa- ❖ tion to such an extent that our men here invariably ask, when in- ❖ structing students, if the inlay is a compound one, and if so this ❖ feature is especially well carried out. ❖ ❖

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"FOR THE SAKE OF THE discussion at this time let us dismiss the ❖ question as to the actual amount of contraction of gold when cooled ❖ down from a state of fluidity to a solid, and accept it as being from ❖ 1% to 2%. Then let us examine a M. O. D. molar cavity such as ❖ is shown in Fig. 2, which will not meet the criticisms of some of my ❖ Western friends in the amount of extension at the cervical margin,

❖ but which is used by us in all relatively immune cases. It will be noted ❖ that when one looks at this cavity from the occlusal aspect, every ❖ surface is so tapered that every angle of the cavity is plainly seen. ❖ These tapered surfaces are made to as high as 25% or 30% in cases ❖ where the cavity is long from cervical to occlusal, for the purpose ❖ of increasing the retention in the short cavities which are less ❖ difficult to fit than the longer ones. If a wax pattern be drawn ❖ from this cavity and an inlay made in gold without changing the ❖ dimensions of the wax, it is found that the inlay will not go quite

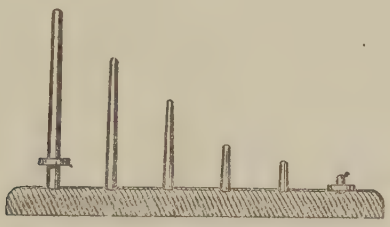

Fig. 3

❖ to place 'without fitting it to the cavity,' or without spreading the ❖ inlay somewhat in the mesiodistal direction. By removing a little ❖ from the inlay on surfaces marked 'A-B,' Fig. 2, it will be found that ❖ the inlay will go to place with a light stroke, or two from the mallet. ❖ This is the outside dimension to be fitted and a contraction of ❖ 1/10,000 inch in one of these inlays at this place will manifest itself ❖ in the form of a crevice at the cervical margin much greater than ❖ the degree of the shortening of the inlay. The shortening has not ❖ let the inlay down. If the taper is only a slight degree the crevice ❖ will be much larger than if it is upwards of 25% or 30%. This is ❖ shown in the set of six mandrels (Fig. 3), the longer one having ❖ a taper of 1% per inch, the second 5% per inch, the third 10% per ❖ inch, the fourth 15% per inch, the fifth 20% per inch, and the ❖ sixth 25% per inch. All of them are ¼ inch at the bottom. If ❖ a wax washer is removed from the bottom of the mandrel with the ❖ 1% taper and a gold one made from the pattern we find that if ❖ the wax is not enlarged it goes back on the mandrel only to the place ❖ indicated by the illustration. If it is now placed on the mandrel ❖ with the 25% taper but of the same dimensions at the bottom we ❖ find that it goes practically to the bottom. In other words, a given ❖ dimension is located farther down as the taper increases. ❖ ❖

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"OBVIOUSLY, IF THE TAPER were increased beyond 30% the mandrel ❖ would decrease in height until it became a nearly flat surface with a

slight elevation in it, and the gold washer would go so near to the bottom that it could not be detected, by the naked eye at least. On the other hand if the gold washer were placed upon a mandrel of the same dimensions, but without any taper it would not go over it at all. After keeping careful records of several hundreds of these fillings we have concluded that with cavities of medium, or long dimensions, from cervical to occlusal, the retention is sufficient when tapers of 25% or 30% are used.

"THUS WE HAVE CONCLUDED that with accuracy and constancy in technique, such as has been advocated by Taggart, and a cavity tapered in proportion to its length from cervical to occlusal, the M. O. D. cast gold inlay can be 'made to fit' so closely that it cannot be told from the gold foil filling with the naked eye. We are of the opinion, however, that without the fitting it cannot be done uniformly with the great number of complex cavities that we find in our clinic.

"THERE ARE TWO THINGS that should be kept in mind in connection with the fitting. The first is that particles of investing material adhering to the inlay are often of greater linear dimensions than the linear shrinkage of the gold. The second is that investing materials have an apparently smooth surface before they are dried out but have a porous appearing surface after being dried out. This is due to the disappearance of water and thin investing matter in the drying process leaving visible interstices to be filled with the molten gold. This makes an inlay that has on its surface little elevations that were not on the wax pattern, and which have linear dimensions greater than the linear contraction of the gold." 1916.

COMMENT. An article published by the present writer in January 1904, in connection with porcelain inlay work, seems peculiarly pertinent here, more especially because, as recently as February 1928, Drs. Gillett and Irving, in their series of papers dealing with cast gold inlays, have quoted this article as expounding principles which are as fundamentally applicable to gold as to porcelain inlays. This article reads as follows:

"PRINCIPLES FOR PORCELAIN INLAY CAVITY PREPARATION. It is possible to so arrange a cavity that, while at all other parts the cementing medium surrounding the inlay may occupy at least as much, or even more space than did the matrix, along the margins the joint may be made so close that the space will be considerably

❖ less than the thickness of the matrix material, and in some cases may
❖ even be brought into actual contact. ❖ ❖

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"IMAGINE A CAVITY having the shape of a perfect cube, that is to
❖ say with sides actually parallel with one another, and rising at right
❖ angles from the bottom (Fig. 4). Suppose this box-shaped cavity
❖ to be evenly lined with a layer of either gold or platinum, and
❖ this lining removed without alteration of shape, to be used as a

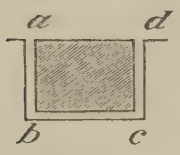

Fig. 4

Fig. 5

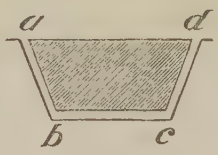

Fig. 6

❖ matrix. Then suppose that the porcelain is accurately fused, pro-
❖ ducing a perfect cube. If we strip the matrix from this cube of
❖ porcelain, and drop the same accurately into the cavity, examination
❖ will show that it can be brought into actual contact with the bottom
❖ or floor, but that space will exist at all four sides. Lateral move-
❖ ment will bring the block into contact with two other sides in addi-
❖ tion to the floor (the space at the opposite sides, of course, being
❖ doubled,) but no manipulation will produce contact at all four
❖ sides. Thus the margin must of necessity be open as wide as the
❖ thickness of the matrix, throughout one-half of the margin at least.

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"THIS SHOWS THAT in cavities surrounded by tooth substance, as in
❖ approximal cavities, in incisors which do not reach the incisal angle
❖ as well as in labial cavities, the preparation of margins at right
❖ angles with the adjacent surfaces is erroneous. ❖ ❖

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"WE HAVE SEEN that the cube dropped into the box comes into
❖ actual contact with the bottom. It follows that if the sides are flat-
❖ tened out to the same plane (Fig. 5), a mass of porcelain fused on a
❖ piece of metal which has been adapted to such a surface would come
❖ into contact throughout. Thus it follows that the nearer the sides of
❖ a cavity approach the same plane as the floor, the more accurate will
❖ be the adaptation of the porcelain to the cavity surface. But this
❖ flattening of the cavity leaves us more and more dependent upon the
❖ cement for retention, since the flatter the surface the less mechanical
❖ source of retention we will have. There is little doubt that the

first form, the cubical cavity with sides at right angles to the floor, will afford the greatest opportunity for retention; the second, where the cavity is entirely flat, offers the least retentive quality even though it gives us the closest joint.

"IF WE FORM A CAVITY, with the walls inclined at an angle of forty-five degrees (Fig. 6), we make a compromise. The retention is worse than in the cubical form and better than in the flat; but conversely,

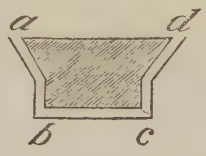

Fig. 7

the joint is better than in the right angled cavity, though worse than in the flat. If an inlay for such a cavity is dropped into place till in contact with the bottom (b to c), the space left at the margins (a and d) will be just one-half the thickness of the matrix used. It follows, therefore, that if the bottom of the inlay be ground off to the extent of half the thickness of the matrix, the whole inlay may be brought into contact with the cavity at all parts.

"FOR A MOMENT it would seem that this is the best result obtainable; but further analysis shows that it is not. And here we come to the influence upon cavity preparation which the cement will have. We have shown that in the first cavity, the cube-shaped, the inlay can be brought into contact with the floor (b to c); but this is only true in the absence of an interposing substance. If cement be first placed in the cavity, the cubical block of porcelain can no longer with reasonable force be pressed against the bottom, because the lateral walls, rising at right angles (angles a, b, c, and d, e, b) will imprison the cement between the inlay and the cavity bottom and prevent its displacement. Thus this form of cavity, though having the greatest powers of retention, will nevertheless produce an inlay surrounded by the maximum quantity of cement. In the flat cavity, the greatest quantity of cement can be displaced, as exit is afforded at all sides, so that the thinnest residuum of cement would remain at the joint (a and d) and between the inlay and the cavity surface. In the third form, where the walls are made flaring at an obtuse angle, we would be able to displace a greater portion of the cement because of the lessened resistance of the walls, than in the case of

the cubical form, and we would get a much closer joint, but we would have at the same time less retentive strength.

"CAN WE DO EVEN BETTER than this? I have said that analysis shows that we can. We may do this by inclining the wall only one-half the depth of the cavity (Fig. 7). Thus the lower part of the inlay would fit as did the cube, while the upper part, with the walls now flaring off, would give us opportunity for a closer joint along the margins. The resulting inlay would have a form diagrammatically similar to the head, and part of the shank of a screw. Theoretically, this would not obtain so good a joint as where the flare of the walls reached fully to the bottom, because the lower right angles would still imprison the cement and prevent forcing the inlay tightly to place. Practically, however, this is overcome by grinding from the extreme bottom of the inlay so that contact along the flare of the walls could be reached before the actual bottom of the cavity were touched. In practice also we would not have actual angles.

"THESE, IT MUST BE UNDERSTOOD, are underlying physical principles. Their application to practical work must be modified to meet the characteristics of the material with which we deal. For example, however desirable it might be, theoretically, to flare the walls to an inclination of forty-five degrees, in many instances this would produce too weak an edge of porcelain. Judgment, therefore, must be used, and the departure from the right angle formation must depend upon the masticatory stress which is to be met."

THE ABOVE was written before the advent of the cast gold inlay, and the chief aim of the proposal was to indicate a method by which the cement margin could be reduced to that minimum possible by the extreme compression of the cement. It is evident that the minimum exposure of cement around a porcelain inlay must depend entirely upon cavity form.

THE PRINCIPLES above enunciated are just as applicable to the gold inlay, but with metal in the inlay, we are not entirely dependant upon cavity form for the reduction of the marginal cement line. A cavity preparation such as indicated in Fig. 7, will produce an inlay whose margins can be spun over the cement until, with skilful manipulation, the cement line not alone disappears entirely, but the cement itself can be protected by an overlay of the marginal gold, by using smooth stones and burnishing, at the time of cementation, and during the setting stage of the cement.

IN CAVITIES formed as shown in Dr. Ward's Fig. 1, which is seen at once to be formed in accord with the principles shown in the writer's diagram, Fig. 7, if we realize that the inlay can be made to drop into the cavity until the margin of gold is in contact with the tooth margin, by very slightly shaving off the under, or bottom side of the inlay, we can be prepared to meet this condition by extending the wax pattern slightly farther than the actual, cut margin of the cavity, thus affording extra metal for the spinning process.

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THIS SAME METHOD, applied to the M. O. D. inlay, will cause the inlay to fit, if the cavity is prepared as indicated in Dr. Ward's Fig. 2, which again follows the principles which we are advocating, although here applied to outside rather than to inside dimensions. With the M. O. D. inlay the "underside, or bottom" of the inlay has three sides, and the principle of reduction to permit the inlay to drop deeper, must include all three sides, and this will permit the inlay not only to drop deeper into the cavity, but also will relieve any binding that might occur mesiodistally, due to contraction of the gold, which however is never necessary, such binding being always due to faulty technique.

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INDEED the grinding of the underside of an inlay is not advocated as a means of improving the fit of the inlay but only to perfect the margin by narrowing the cement line: and extra wax should be extended over the cavity margin, so that the inlay may not drop so deep into the cavity that the enamel margin would be uncovered, and consequently spoiled by the grindstone when polishing, at the time of cementation. 1928.

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XXIII.

WELL, I HAVE BEEN to Pittsburgh and Louisville. In Pittsburgh it was fairly cool on the seventeeth floor of the Hotel William Penn, where the orthodontists and periodontologists met, and ate. In Louisville it was actually cold down in the Grill of the Seelbach. Of the climate in other parts of these two cities I prefer personally to say nothing. One Californian, however, did remark: "What do I think of the climate in Louisville? Why, man, you haven't any."

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AT LEAST IT MUST BE ADMITTED that there was no "climate" to speak of. That is why I say nothing about it. As regards the two cities, however, they are certainly beautiful, especially those parts which we saw from automobiles after eleven o'clock every night. The parks and parkways were not only very attractive, but we found the moving automobiles much cooler than the hotel bedrooms, even though each was fitted up with an electric fan. And that reminds me!

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THE PRETTY LITTLE MAID on our floor asked my room-mate one morning: "Would you like me to get you a fan that osculates?" "Why, no," said my friend, "I can osculate myself; but if you have a fan that vacillates I will take it."

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BUT I CANNOT TELL you about Pittsburgh and Louisville just now, because we did not finish last month's talk, and must resume our discussion of the possibility of making a M. O. D. inlay. Regardless of debate, however, the question was finally settled in Louisville by a single exhibit made by Dr. B. B. McCollum, of Los Angeles. I presume all will admit that though a thousand men fail to accomplish a certain thing, let but one man succeed and he proves that success is possible.

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AT LOUISVILLE I was shown an absolutely perfect M. O. D. inlay which had been made by the direct method by Dr. McCollum. When I say "perfect," I do not mean "perfect" according to the exacting standards of the Department of Weights and Measures in Washington, as described so graphically by Dr. Price. But I do mean

"perfect" according to the very highest standard and requirements of constructing a cast gold inlay. This M. O. D. inlay was something more than the usual M. O. D. inlay, because there was likewise an extension into the buccal groove. This one result then proves that a M. O. D. inlay can be made that will fit as it comes from the mold without alteration. This particular inlay was made by Taggart's methods and cast in a Taggart machine.

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LET US NOW RESUME the discussion where we left off last month. Any who missed last month's quota should read that first. Let us now first attend to what our esteemed Brother Dr. J. V. Conzett has to say. He writes as follows:

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"A M. O. D. INLAY, for a molar or bicuspid, can be cast so perfectly that the margins will fit so closely that it will take a glass to detect them, but in order to do so it will necessitate a very exacting technique, which I have worked out and which I will briefly outline.

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"FIRST, THERE MUST BE a proper cavity preparation which contemplates the Black features of flat seats and parallel walls and a proper beveling of the cavity margins. This is one of the most important features of the preparation, for the margins must be so beveled that all of the lines of the cavity will flow into the cavity at a rather acute angle; there must be no long obtuse angle, nor seat, nor shelf at the margin, upon which the finished inlay will ride and not seat deeply into the cavity, and thus take up the shrinkage at the gingival margin.

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"SECOND, THERE MUST BE a proper wax pattern and manipulation thereof. That means a wax that is hard at mouth temperatures. A wax that has to be chilled in order to work is unfit for use, for the alternate expansion and contraction of the wax, during manipulation, distorts the pattern to so great a degree that a good fit is an accident rather than the result of design.

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"THE WAX SHOULD BE properly warmed and not melted, and then firmly pressed into the cavity and pressure 'maintained' until the wax is hard. This to allow of more wax being forced into the cavity to take up shrinkage caused by cooling.

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"NOW, THE ELASTICITY must be released. This in my opinion is the most important step in the process. I cannot make a perfectly fitting M. O. D. if I fail to take this precaution. Dr. W. A. Price discovered that wax is elastic, and by reason of the pressure applied

to it in forcing into the cavity is in an abnormal condition, and upon removal from the cavity, by reason of its elasticity, it has a tendency to resume its normal condition, which causes a distortion of the wax and a consequent misfit. The release of the elasticity is accomplished by heating the wax while it is still in the cavity, by directing upon it, a syringe full of water as hot as the patient can endure. In large M. O. D. inlays I take the additional precaution of melting the wax over the occlusal step where the two approximal portions of the inlay are bridged together.

"THEN THERE MUST BE a compensation for the shrinkage of the gold, for shrinkage is one of the characteristics of gold, or any metal congealing from the molten state, and we cannot prevent it. This compensation is made in the first step by the form of the cavity, as I said, all of the lines of the cavity flowing into the same; so when the wax is removed we shave off a small portion of the wax from the pattern where it comes in contact with the occlusal step, thus letting the inlay seat in the cavity to the depth of the shrinkage discrepancy at the gingival margin, thus closing that space perfectly and making a perfect fit. The investment, casting, etc., must all be carried out at an even temperature, and as open-mouth temperature is practically room temperature, we aim to have the investment and casting processes proceed at the same temperature.

"BY FOLLOWING THESE steps carefully, and then by proper cementation and finishing, an inlay is obtained that is as near perfection as it is possible to make."

UPON RECEIPT of the above I wrote to Dr. Conzett as follows: "I thank you very much for your letter, but I must ask you an additional question, because your reply is somewhat ambiguous. My original question was, 'Can a M. O. D. inlay be cast to accurately fit a correctly shaped cavity in a human tooth?' In your letter you first say that it can be done, and then you practically give us a description of a method which would seem to indicate that you do not think it is possible; that is to say, you do not simply take a pattern of your cavity and cast it with the expectation that it will fit. If I understand you rightly, you make a special preparation of the cavity, and then subsequently you make an alteration in your wax pattern, with the idea that this will allow the gold to be seated more deeply into the cavity, and thus occupy the space which would otherwise exist at the gingival margin, because of shrinkage. But, my dear Doctor, if there is shrinkage in the gold, would not there be shrinkage across the long diameter of the gold, that is to say, mesio-

distally, which would make it impossible to put an inlay into the cavity at all? That is why I have selected a M. O. D. inlay for this discussion. As a matter of fact, I have seen inlays of this character which could not be placed in a cavity at all, but I have felt that it was due to faulty technique. Now, if there is not enough shrinkage of the gold to make the inlay bind mesiodistally in going in, why should there be enough shrinkage to show a fault along the gingival margin? In other words, why should the gold shrink more appreciably in its short diameter than in its long diameter?"

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DR. CONZETT REPLIED as follows: "Your question is a very pertinent one, and one that I should not have overlooked, but in my hurried answer to your question I did not give the whole of my technique. There certainly is shrinkage mesiodistally as well as occlusogingivally. The mass of gold shrinks in all of its dimensions to a common center, or in a complicated piece like an M. O. D. inlay, to a number of centers; so you will get a discrepancy at all margins, the greatest being that of the longest dimension. That in an M. O. D. in a molar would seem to be in the mesiodistal diameter, but as to the shrinkage that would cause binding on the axial walls, the measurement would not be from contact point to contact point, but from distal axial wall to mesial axial wall. This is considerable, however, in large cases, and if the walls were absolutely parallel the inlay would doubtless not go to place; but as in these cases we cause the mesial and distal axial walls to converge occlusally, it makes an inclined plane that the inlay may ride over, and by being malleted into the cavity the slight discrepancy is relieved by the gold stretching over the inclined planes and into place.

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"I DO NOT THINK that we can cast a piece of gold without shrinkage. That is a physical law of the metal, and we cannot overcome it, but we may and do compensate for this shrinkage in several ways. Some shrink the wax by chilling it and make an inlay so much smaller than the cavity that the additional shrinkage of gold makes a tremendous discrepancy, that is all laid to the gold, which is wrong. Others heat the investment and cast in a hot mold, and thereby obtain an inlay larger than the pattern and one that will sometimes stretch over the M. O. D. area; but by following the described technique of cavity preparation, manipulation of wax and casting, a result that approaches perfection very closely can always be obtained."

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THE NEXT CONTRIBUTION is from Dr. F. S. Meyer, of Minneapolis, who writes as follows: "In regard to your request for my opinion on an M. O. D. cast inlay I will say that one can be cast to fit a correctly

shaped cavity in a human tooth. One can be made to fit so closely that we cannot detect with an explorer the gingival margin, nor see a flaw with our naked eyes in the visible margins.

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"I THINK THIS COVERS the point so far as your request goes. For some time, however, I have wished for a chance to say something of my experiments and the conclusions which they have led me to, and I shall take this opportunity to do so.

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"OUR MAIN TROUBLE has been due to the shrinkage of the gold in passing from the molten to the solid state. So I set out to find out how great that is, and to what an extent it may be overcome. By means of molds I made some wax cylinders one inch in length. On the ends of these I fastened caps, slightly rounded, which were made from platinum foil. This insured perfectly smooth surfaces for taking my measurements. I found that if the wax were measured at the temperature of the mouth, and invested with investment made by drawing cold water from the tap, I obtained a shrinkage of twenty one-thousandths of an inch, or two per cent. If the first measurement were made at atmospheric temperature, and investment mixed as before, I obtained a shrinkage of only sixteen one-thousandths of an inch. In short, an inlay shrinks nearly one-half of one per cent. while passing from the temperature of the mouth to that of the room, while still in the wax state.

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"I CAME TO THE CONCLUSION that if I could make my investment at a high enough temperature I could expand my wax pattern the amount of the shrinkage of the gold. I made an instrument for mixing my investment at any temperature at which I chose to set my thermostat. I was thereby able to cast a gold cylinder which was longer than the original pattern.

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"THE WAXES NOW ON THE MARKET, however, will not stand a temperature high enough to allow me entirely to overcome all shrinkage without getting a rough inlay. I therefore had to seek relief in another direction, namely, chilling the wax while in the cavity. This causes an actual expansion of the wax between two points that bind. I now make my investment at a temperature of one hundred and fifteen degrees, and keep it at that temperature until the invested inlay is ready to burn out. By actual measurement, I do not overcome all the shrinkage, but the discrepancy is so slight that the inlay goes to place, due possibly to the elasticity of the tooth, or the malleability of the gold, or both.

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"IN SOME STEEL MODELS which I used for my experimental work I was not able to get as good results under the same conditions as I did in the natural teeth. I judged this was due to the lack of elasticity of the steel, as compared to the structure of the natural tooth. I also found that the softer the gold alloy the easier the inlay went to place, due no doubt to its malleability. I found that the least pressure I could use and still get the sharp margins, the better the inlay would fit.

"THE EXCESS GOLD must be somewhat in proportion to the size of the inlay cast. In order to obtain this I made a very simple pair of scales founded on the relation of the specific gravity of wax to that of gold. It takes me no longer to ascertain the exact quantity of gold needed for any inlay than it would to guess at it. I then add enough excess according as I deem necessary.

"I NEVER REMOVE A WAX pattern to trim it, nor for anything else, and then put it back into the cavity. Nevertheless, by my method I can always be sure that my gingival margin is correct. I do not believe anybody can handle a wax pattern without some danger of injuring the sharp margins, and it is very difficult to add more wax at these points. I am aware that this is contrary to the usual way of taking an impression, but I am positive that from a scientific standpoint I am right.

"SO MUCH CAN BE SAID on the subject of cast gold inlays that a volume might be written. With all that, there is a great deal to be learned. There is a wide field for research. If my theory is correct, which I firmly believe it is, we want a wax which remains hard at a higher temperature than those we have now. This leads into experimental work, for which the manufacturer is better equipped than I."

"WOULD THE GODS THE giftie 'd gie us, to see oursel' as ithers see us." I doubt that I have that quotation exactly correct as to spelling. But I am compiling this in my little log house in the woods, and the nearest that I have to a book of poems is a volume entitled, "I Go Fishing," by N. S. Prime. However, I am sure that I have the sense of what the poet meant, and the art of spelling is another gift that only the Gods can gie us, anyway. You will realize my meaning better, perhaps, when you read the next communication. Mr. Frank W. Hancock is well known to many of you. For years he has been a familiar figure at dental society meetings, giving clinics on the Taggart method of making inlays. For the past two or

three years he has been visiting dentists in their offices and instructing them and their assistants in this art. More than any other man, therefore, he knows intimately what dentists are doing and how they are doing it. Also, probably he personally has made more cast gold inlays than any dentist alive. His letter is interesting. He says:

"I HAVE NOT BEEN INVITED to participate in the discussion anent the M. O. D. inlays, but Dr. Taggart showed me your letter and suggested that possibly I might add something of interest. The question I believe is, 'Can a M. O. D. inlay be cast to accurately fit a correctly shaped cavity in a human tooth?' Can the making of the pattern, investing, burning out and casting in the usually haphazard way be productive of M. O. D. inlays that accurately fit human teeth? The occasional accident proves that even this may be done. After eight years, dentists are studying the Taggart technique seriously, and some of these men now know that the proportion of M. O. D. inlays cast to accurately fit correctly shaped cavities in human teeth have increased as a result of that study.

"SINCE DR. TAGGART ANNOUNCED his invention of the cast gold inlay, I have sought information and improvements in the offices and laboratories of dentists from New York to San Francisco, and have found none. I make a business of teaching dentists and dentists' assistants to make cast gold inlays. During the past seven years I have failed to find a single point, or principle, to incorporate in my course, which did not emanate from Dr. Taggart; during this time I would willingly have paid for information which would have enabled me to make better inlays either by more simple, or by complex methods.

"AS I VIEW IT, Dr. Taggart presented a system which even careless followers practice with a large measure of success. Men of reputation have modified, or attempted to change this system, and have exploited said changes in the usual manner. For the time being, they have attracted enthusiastic followers, who ultimately have returned to what little they understood of the Taggart processes, or else have discontinued casting. I have never found a dentist who could demonstrate that he possessed complete knowledge of the Taggart system, practice it and discard any part of it permanently for another.

"THE FIRST TAGGART DIRECTIONS regarding cavity preparations, hardness of wax and use of same, were absolutely ignored; manufacturers recognizing that dentists were in the habit of using soft

❖ waxes prior to the advent of the Taggart inlays, capitalized this
❖ habit and supplied soft inlay waxes and apparently an excuse for
❖ innumerable theories on the elasticity of soft waxes incorrectly used.

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"I HAVE INDUCED thousands of dentists to make patterns in a cavity
❖ prepared in a typodont to prove to them that they were not follow-
❖ ing the Taggart technique. Every man, without a single exception,
❖ proved that he failed to grasp this particular principle which, if
❖ used, removes 'elasticity' of waxes as a factor in casting accurately
❖ fitting inlays. I collected 800 paterns made for the above-mentioned
❖ cavity, apparently no two of them alike. It was an occlusal distal
❖ cavity in a molar tooth. None of these patterns showed a clearly
❖ defined gingival seat." ❖ ❖

✣ ✣ ✣

LASTLY, LET US HEAR FROM DR. TAGGART himself, who writes
❖ as follows. Please imagine him sitting at table and talking to us all:
❖ "The question asked, 'Can a M. O. D. inlay be cast to fit the cavity?'
❖ has practically been answered in the affirmative, and shows that if
❖ by the multiplicity of methods used, such as hot wax, cold wax, hot
❖ mold, cold mold, etc., etc., 'ad libitum,' it can be done, the basic
❖ principles which I presented to you eight years ago must have been
❖ sound, or they could not have stood the strain of having so many
❖ foster parents trying to spoil them. ❖ ❖

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"THE ORIGINAL PRINCIPLES given to you have stood the test of
❖ time, and if to-day the best fillings are made by following these
❖ methods, why fool yourselves by thinking that the expanding of
❖ your wax pattern by heat, or contracting it by cold has anything
❖ to do with the results, when those who do none of these things get
❖ as good if not better fitting inlays? ❖ ❖

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"I DO NOT MEAN TO SAY, 'Do not experiment,' but in your experi-
❖ menting be scientists and not pseudo-scientists, which means false,
❖ or counterfeit scientists. In making your experiments, remember
❖ that accurate technique is the key to success in making perfect fit-
❖ ting inlays. The principles have been disclosed to you, and skilled
❖ mechanics have shown you that these principles are correct; but
❖ until you have it beaten into you that accurate technique is abso-
❖ lutely necessary, you will always be looking for some 'Will o' the
❖ wisp' such as hot pattern, or cold pattern to help you out. ❖ ❖

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"THOSE OF YOU WHO do not believe that a M. O. D. inlay can be
❖ made to fit must remember that the men 'Around the Table' who say
❖ it can be done are men who have, by long experimenting out of

❖ the mouth, perfected their technique to such an extent that they do
❖ make these fillings fit, and unless you do likewise your inlays will
❖ never be anything but misfits. In your experimenting remember
❖ that a thing to be right must be reasonable. ❖ ❖

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"DR. MEYER SAYS HE 'now chills his wax before taking it from the
❖ mouth, and that this expands it.' It does not. He then invests it
❖ in a hot investment, at a temperature of 115 degrees. What effect
❖ does this have on his chilled pattern? Does it expand or contract
❖ his pattern? Long before the investment hardens, and could pos-
❖ sibly control the size or shape of the wax pattern, the wax has be-
❖ come heated to 115 degrees, so what good did it do to chill the
❖ wax? ❖ ❖

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"THERE IS NOT THE LEAST DOUBT in my mind but that Dr.
❖ Meyer, and all the others who have these special 'stunts,' are getting
❖ better fillings from day to day, but they are getting better results in
❖ spite of their 'stunts,' and not because of them. The real reason
❖ why they are getting better results is this: Having formed a theory,
❖ in order to make it work out they have found the necessity for
❖ accurate technique, and this same accurate technique will make a
❖ better filling, whether used on their theory, or on yours, or on mine.

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"MY ADVICE, THEN, is to foster a theory, and in your effort to make
❖ your adopted child stand up and be accepted by others, you will
❖ unconsciously acquire a technique which will make any method a
❖ better one. ❖ ❖

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"DR. CONZETT SAYS 'all metals in congealing from the molten state
❖ shrink.' This is not so, as there are several metals, especially the anti-
❖ mony and bismuth groups, which have a very decided expansion in
❖ passing from the molten to the congealed point. This is well known
❖ to metallurgists. But his statement that all golds contract on cool-
❖ ing is correct. ❖ ❖

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"SINCE THE INTRODUCTION OF THE CAST INLAY quite a
❖ number of pseudo-scientists have given you various reasons why
❖ the inlay does not fit at the gingival margin, and they have all said
❖ it is because the gold shrinks at that point on account of a law of
❖ Mother Nature that metals shrink on cooling, just as though the
❖ Old Girl had it in for the dentist and made gold shrink most at the
❖ margin where he wants the best fit. As a matter of fact, metals in
❖ expanding or contracting do so equally in all directions. ❖ ❖

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"I WILL MAKE A STATEMENT now which contradicts all these theories, and no doubt you will be surprised.

"THE REASON WHY THE INLAY APPARENTLY does not fit at the gingival margin is because it is larger than the wax pattern, and not because it is smaller or has contracted. The gold shrinks equally in all directions; if it had contracted, the gingival margin would be the very place where the filling would fit the best, as it would not meet with any frictional opposition in reaching this margin.

"THIS CAN POSSIBLY be made clearer by a homely comparison. Let a well represent the cavity, and a tub represent the filling. If the tub is the least bit too large to drop down the well it cannot reach the bottom; but if it is a bit too small, it will go to the bottom of the well, and this will be the only place the tub will fit.

"NOW, WHY IS THE FILLING LARGER than the wax pattern, which you will all admit fitted the cavity? I will explain:

"THE TERM COEFFICIENT OF EXPANSION means the sum or amount of expansion, and the coefficient of contraction means the sum or amount of contraction. In casting an inlay the investment must necessarily be brought to a very high temperature, and the coefficient of expansion in the investment is greater than the coefficient of contraction in the metal. In other words, you are casting into a mold, which, on account of the high temperature necessary to melt the gold, has expanded more than the gold will contract. Hence you have a casting slightly larger than your wax pattern. Therefore, your filling cannot reach your gingival margin. And to account for this you have thought and have been told that the filling had shrunken at the very point you wanted it to fit the best.

"YOU REMEMBER, I have always advocated casting into a cold mold, and the reason was that I wanted the investment to expand as little as possible, and this is why my machine was made with a nitrous oxid blowpipe, so that the gold could be melted so rapidly that the investment could not get hot enough to unduly expand.

"I REALIZE THAT THOSE who use other machines than mine cannot cast into a cold mold, as the very nature of the ordinary compressed air blowpipe is such that the whole flask, investment and all, must necessarily be brought to a red heat before the gold

will melt, consequently the mold cavity will expand more than the gold can possibly shrink.

"KNOWING FROM THE TIME of my first successful casting that the metal expands, I advocated the use of clean 24-K. gold because, first, it changes form less in congealing than any known metal; second, being more malleable than any of its alloys, it could, by slight malleting, be driven to its seat, as a hard, unyielding alloy could not.

"WHENEVER THE UNSKILLED DENTIST fails to make a perfect casting, he is quite apt to lay it to faulty principles, or claim that some law of Nature makes it impossible. This is only a salve to his conscience, and should not be accepted by others.

"TO SUM UP THESE REMARKS, I will ask, 'Do all of these hair-splitting differences of opinion about expansion and contraction militate against the practical use of the cast inlay?' Most certainly not, as more inlays are faulty because of careless technique than from all the laws of Nature combined working against us. One small gold nodule, too small possibly to be discovered by the naked eye of the average dentist, will cause more change in the dimensions of the casting than all the shrinkage or expansion could possibly cause in a piece of metal the size of an inlay.

"SO I SAY, GET BUSY and improve on your careless methods; get busy and become a constructive scientist and not a destructive one; get busy and improve your technique, and you will say as others do, 'It can be done.'"

1916.

XXIV.

IN AUGUST AND SEPTEMBER last we had two talks on the general subject of the cast gold inlay, and had supposed that we had exhausted the subject, if not the members of the club. But it seems that one of the discussers has a few more words to say, so let us listen to him before we forget what the others told us. This communication comes from Dr. F. S. Meyer, of Minneapolis, who writes as follows:

"I HAVE TAKEN GREAT interest in the various statements made 'Around the Table' in August and September, but the fact that they are all so positive and still differ so greatly shows that some of us are wrong, or that we do not understand one another. In order to come to a closer understanding I shall analyze some of those statements. Dr. C. S. Van Horn of Bloomsburg, Pa., makes the following statement:

" 'THEREFORE, if by the inquiry you mean: Can a M. O. D. 24-K. gold inlay be cast to fit a like cavity in a human tooth in the mouth, as accurately as a casting for a simpler type of cavity, my answer is: It can.' I disagree. Gold shrinks and the greater the distance between two points in the inlay where there is a tendency to bind, the greater will be that tendency.

"DR. MARCUS L. WARD says: 'We believe that a M. O. D. cast gold inlay can be made to correctly fit a cavity in a human tooth.' He further says: 'We can do some of them and we can do some of the more regular forms of castings that we have tried in the laboratory, but we cannot make the large number of irregularly shaped ones meet our standards without the fitting.'

"WITH THOSE STATEMENTS, I thoroughly coincide, but perhaps you have all asked yourselves the question: 'Why do some of my inlays fit so much better than others?' Most of us have noticed that when the inlay is bulky the gold often breaks, or is left porous where the sprue was inserted into the wax. We know that the larger the bulk of molten gold we have the longer it will take to radiate its heat and begin to congeal.

"HENCE WE SEE in the above case that the gold sprue has congealed and completed its contraction before the larger mass has started to congeal.

"NOW, WHEN THE LARGER MASS of gold starts to congeal it contracts toward the center of its mass and hence pulls away from the sprue enough to break, or leave a porosity. This is most likely to occur where the main part of the large mass lies at right angles to the point of insertion of the sprue. This breaking away of the gold sprue from the inlay never occurs where the sprue is inserted into the occlusal portion of the inlay if that portion is thin. Here the occlusal portion either congeals and shrinks before the larger mesial and distal portion of the inlay, or if the mesial and distal portions are also thin, while it is shrinking and still in a partilly congealed state there is not bulk enough of gold, and hence strength enough in the mass, to overcome the investment compound; hence a readjustment of the molecules takes place to compensate.

"IF THIS THEORY IS CORRECT it will explain why we get a better fit when casting into a cold mold in certain types of inlays, for here the thin part congeals much more rapidly in proportion to the bulky part. It will also explain why some M. O. D. inlays go to place and not others.

"IN ORDER TO PROVE this theory to my own satisfaction I made one wax cylinder .962½ inch in length after rounded platinum caps had been waxed on the ends to facilitate measuring. I made another with large balls of wax near the ends, but exactly the same length. I measured both at the same temperature and invested both with the same mix of investment. The cylinder with the balls of wax near the ends had two thousandth of an inch shrinkage less than the cylinder which was thin all the way, showing that the cylinder of gold between the balls had at least partially completed its shrinkage, drawing from the molten balls of gold, before the gold in the balls started to shrink. I believe there is here a wide field for investigation. I should like to know at what point between the time when the gold is in a fluid state and the time when it becomes a solid, does the greatest shrinkage take place?

"LET US NOW TURN to some of Dr. Taggart's statements. He starts out by misquoting me and then proceeds to analyze the misquoted statement. He says: 'Dr. Meyer says he now chills his wax before taking it from the mouth and that this expands it. It does not.' I

said that I chill my wax while in the cavity and that this causes an actual expansion between two points that bind.

"AS FURTHER PROOF of this statement next time you make a gold casting for a porcelain tooth try this experiment. Complete your waxing over the porcelain tooth, insert your sprue and drop the whole thing into ice water for about five minutes, or place in the open window where it will become chilled. Then remove your wax pattern and invest. The difference in results are the most noticeable when using hard gold alloys, such as clasp metal.

"WHEN YOU CHILL YOUR WAX while in the cavity it shrinks wherever it is not prevented from doing so by the walls of the cavity. Here there must be a rearrangement of the molecules of wax. Now, when this wax pattern gets back to the temperature it was at before chilling, the parts that could shrink will go back to their original size approximately, while the points of the wax where there was a binding will be relieved to the extent of leaving an infinite crevice by the mesiodistal expansion of the occlusal portion of the wax inlay. This tends to compensate to some degree in relieving the binding due to shrinkage of gold."

SORRY TO INTERRUPT DR. MEYER, but I cannot follow this argument. In the first place I fail to see how Dr. Taggart has misquoted him. One statement is that the wax was chilled before taking it from the mouth, the other that it was chilled in the cavity. So far there is no divergence. Then Dr. Taggart understood Dr. Meyer to say that this expands the wax, whereas Dr. Meyer explains that he means that it expands the wax between two points that bind. But how can that be? Dr. Meyer then goes into greater detail and tells us that when the wax still in the cavity is chilled "it shrinks wherever it is not prevented from doing so by the walls of the cavity."

I COULD COMPREHEND a statement to the effect that if wax while in a confined space were heated, the normal expansion might be interfered with by the resistance of the confining walls, thus perhaps causing the forces of expansion to distort the wax in some direction where there was no resistance; perhaps causing the wax to bulge upward.

IN SIMILAR FASHION, when chilling a wax pattern if the central mass of tooth structure, that which lies between the mesial and distal flanges of the pattern, act as a resistance to the forces of contrac-

❖ tion, it seems to me that a lowering of the occlusal surface of the ❖ pattern, or else an actual splitting of the wax might occur. But I ❖ cannot conceive how chilling a wax pattern would cause expansion of ❖ any part of the mass in any direction, under any circumstances. ❖

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BEFORE RETURNING to Dr. Meyers let me make one statement. In ❖ my opinion, much time and ingenuity has been wasted in these ❖ investigations as to the behavior of waxes, their expansion and con- ❖ traction, confined and released elasticity, etc., etc., because at the ❖ outset the investigators have failed to grasp the most important ❖ factor in the correct use of pattern wax. ❖ ❖

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MEN USE WAXES too warm. ❖ ❖

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TRY MAKING PATTERNS with cold wax. ❖ ❖

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THAT, OF COURSE, is a figure of speech. We are told to cast in a ❖ "cold mold," and, of course, it is not possible to melt gold in the ❖ crucible just above the mold and keep the mold actually cold. What ❖ we mean then is to keep the mold as cool as possible. ❖ ❖

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THE SAME RULE should apply to the pattern wax. Don't see how soft ❖ and mushy you can get your wax, but see how cold you can keep it ❖ and still use it for taking an impression. You will be surprised to ❖ find how cool you can keep the wax and use it. ❖ ❖

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THEN HAVING FORCED this "cool" wax into the cavity, continue ❖ the pressure while the wax is hardening. This pressure rearranges ❖ the molecules as they grow colder and colder, until at last the real ❖ impression is taken at that psychological moment when the wax has ❖ congealed to the point where it cannot be made to further alter its ❖ form by pressure. ❖ ❖

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THUS THE PATTERN, the final pattern is taken with "cold wax," and ❖ you need not bother much about contraction and expansion prob- ❖ lems. Now, if Dr. Meyer will pardon me, we will hear the rest of ❖ his letter. ❖ ❖

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"DR. TAGGART'S STATEMENT that the M. O. D. gold inlay does not ❖ reach the gingival margin because it is larger and not because it is ❖ smaller is not true, and his comparison of an M. O. D. inlay to a tub ❖ in a well is not appropriate. His statement that the term coefficient ❖ of expansion or contraction means the sum, or amount, of expan- ❖ sion or contraction is also not true. The coefficient of expansion

means the expansion of a unit of dimension per degree of heat. He further states, or means to state, that the amount of expansion of the investment is greater than the amount of contraction of the gold. If this were true the fit of the inlay would vary with the size of the inlay which he says is not the case. I do not believe the expansion of the investment is as great as Dr. Taggart says, if there is any expansion at all.

"THE AMOUNT OF EXPANSION of the ring around the investment cannot be very great at the temperature to which the investment is heated in burning out the wax and still we often see a crevice between the ring and the investment. This would indicate a shrinkage rather than an expansion of the investment. Further, if a wax cylinder nearly the diameter of the ring is invested in the ring, and a casting made in this mold shows nearly two per cent. shrinkage when pure gold is used, the investment cannot have expanded more than the gold shrinks, as Dr. Taggart says it does."

ONCE MORE I CANNOT follow the argument. If the wax cylinder used in this experiment is "nearly the diameter of the ring" the surrounding mass of investment lying between the wax and ring would be so slight that its expansion could not possibly bear any important relation to the shrinkage of the mass of gold.

LET US USE the **"reductio ad absurdum"** method of argument to make this more clear. Suppose the cylinder of wax to be ten feet in diameter. And suppose that the normal contraction of gold melted in a mold of that dimension would be six inches. Then suppose that we surround our ten-foot wax cylinder with a half-inch of investment material. It is, of course, manifest that the half-inch of investment material cannot expand six inches and thus equalize the contraction of the gold. Dr. Meyer continues:

"IF WE WERE TO CAST a thin flat piece of gold, the thickness of the gold might be greater than the thickness of the wax, if the shrinkage of the gold were less than the thickness of the gold forced into the porosity of the investment. This thickness of gold taken up by the porosity of the investment varies with the pressure used in casting and the state of fluidity of the gold. Hence, these are factors to be reckoned with.

"DR. TAGGART FURTHER SAYS 'that clean 24-K. gold changes form less in congealing than any known metal.' If he means that it shrinks less in congealing he is mistaken, for it shrinks twenty-five

❖ per cent. more than clasp metal, and ten to fifteen per cent. more
❖ than 22-K. gold. ❖ ❖

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"HOWEVER, no matter how much it binds, an M. O. D. pure gold inlay
❖ can be pushed, or driven to place. After having pushed it to place
❖ you can withdraw it, bend it together with your fingers so that it will
❖ not go down to place, and you may again force it down. This shows
❖ that it really does not fit but goes to place because of the elasticity
❖ of the tooth and the malleability of the gold as I have said before.
❖ Taggart admits that it is necessary to mallet all M. O. D. inlays to
❖ place, which would not be necessary if they fitted. As further proof
❖ that the pure gold or pure gold and platinum inlay spreads out at
❖ the gingival margin we find in spite of the contraction of the gold
❖ that when we wax flush at the gingival margin, we still have a little
❖ excess gold to burnish down, or polish off at that point. Now, I
❖ maintain that on account of this malleability or tendency to spring,
❖ pure gold is too soft in a great many inlays and always too soft for
❖ bridge attachments. Dr. Taggart then says: ❖ ❖

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" 'TO SUM UP THESE REMARKS I will ask if all these hair splitting
❖ differences of opinion about expansion and contraction militate
❖ against the practical use of the cast inlay. Most certainly not, as
❖ more inlays are faulty because of careless technique than from all
❖ the laws of Nature combined working against us.' In a measure
❖ he is right. But only by airing our opinions can we come to under-
❖ stand one another and in time have hope of arriving at a real solu-
❖ tion of the problem. No doubt careless technique is responsible for
❖ many failures and especially is that true of the gingival margin of
❖ M. O. D. molar inlays. ❖ ❖

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"I WILL GIVE MY TECHNIQUE in waxing up an M. O. D. molar in-
❖ lay and trust it may be of some value to those who have had trouble
❖ at this vital point. My first step is to force the softened wax into the
❖ cavity so that it fills in the whole interproximal spaces. I trim off
❖ roughly nearly all the excess with the exception of that filling in the
❖ interproximal spaces. Soften the wax on the occlusal surface with
❖ hot air and tell the patient to close his teeth tight. Retrim the
❖ excess from the occlusal surface. Trim wax lightly from the mesial
❖ and distal occlusal surfaces, to the contact points, so that a very
❖ thin matrix can be placed between the excess wax and the adjoining
❖ tooth. Now place one finger upon the wax and the matrix to steady
❖ them and with a warmed burnisher (right and left burnishers are
❖ designed for the purpose) placed between the matrix and the adjoin-
❖ ing tooth, force the matrix toward the gingival margin of the cavity

working it in and out so that the excess wax flows lingually and buccally, and over the gingival margin. Do this first along the buccal then the lingual margin, and perhaps repeat on the buccal margin.

"AFTER YOU HAVE FINISHED the distal surface do the same on the mesial. Now flow a little soft wax on the mesial and distal occlusal surfaces where it was cut away down to the contact point. Proceed to finish the other margin as you always have. Now, when the inlay is removed it cannot catch on the adjoining tooth surface and be disturbed. It will show the exact contact point where a little hot wax may be dropped to compensate for polishing, or it may be left and a little 22-K. solder flowed on after the inlay is cast.

"IF THE WAX SHOULD break away, or pull away from a margin, never try to add hot wax over that point to restore it, but sink a hot flat burnisher into the wax, about a millimeter from the defect, and press the thin softened wax toward the defective margin till it bulges out over the margin. Now flow your hot wax into the crevice thus produced. It does not take as long to do this as to tell about it, and once this technique is fully mastered it is very simple and the results accurate." 1917.

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COMMENT. As I read over the above I find myself wondering why a suggestion therein seems to have made so slight an impression on inlay workers. I allude to what may be termed the "cold wax" method of taking impressions. Of course, as was explained, this does not mean literally using cold wax for impressions, any more than casting into a "cold mold" means that the mold is actually cold.

BUT I THINK it will repay the undergraduate student and others to read the description of the method carefully, digest it and then to try it. Personally I have been doing this during all these years, and within the past two or three years I have greatly improved my impressions for porcelain jacket crowns by applying this same "cold wax" method to that work. It may be worth describing.

PERHAPS ALL who have essayed this type of work have had trouble when taking an impression of a root end that has been prepared for a jacket crown, by having the warm compound (wax) crawl up under and against the gum margin. The following technique simplifies this usually difficult operation.

FIRST THE COPPER band should be accurately contoured to pass under the gum margin equally at all points, and secondly the circumferential fit should be very accurate. This latter is best accomplished by fitting the band while the root end is in a pyramidal form, and before cutting the shoulder. At this time a band, slightly too small, can be forced over the root end, which act conforms it accurately to the circumferential shape, and it may be pressed slightly under the gum without undue discomfort to the patient. The front of the band should be marked with a cross, and also a scratch should be made on the band to indicate how far it passes under the gum margin.

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THE SHOULDER is then cut and the preparation thoroughly polished. The already prepared band is filled with warm, not hot, compound, and a blunt instrument forced into the end of the compound to make a depression that will guide the compound to place over the end of the tooth preparation.

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THE COMPOUND is slightly warmed by rotating the band in a flame and the first impression is taken. The tubular band, with the contained compound, warm but not hot, is carefully but forceably pressed over the preparation, until the gum is reached, and the compound passes slightly under the gum margin.

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IT IS THEN REMOVED, chilled, and all excess compound carved away from the outer surface of the band. Next the compound is carved away within the band until the margin of the band is fully exposed. The compound is then held over the flame until the end of the compound which is to be pressed against and over the preparation is slightly softened. Not really made soft, but just slightly softened. The band is then placed over the preparation and firmly pressed to place until the band passes under the gum margin just as far as was indicated by the marginal scratch mark that was made when fitting the band originally.

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WHEN DOING THIS the band is pressed slowly, firmly and continuously against the preparation and held immovable, but under pressure, until cold. Thus the final impression is taken at the time when pressure can no longer move the compound. Hence the impression is taken with "cold" compound, and will be found to be infinitely sharper than any impression taken with hot, soft compound.

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THE FINAL fit of the jacket crown also will prove that this is the most accurate method; the cold compound impression method. 1928.

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XXV.

I HAVE A QUERY from a Correspondent who must have heard of the sad experience of the Irishman who lived in Peoria. As related by the Irish gentleman himself it reads as follows: "Me name is Finnegan. Mike Finnegan to friends, Mister Finnegan to all others. Me teeth got a little loose, an' I wint to Chicago to a dintist. Not a plain dintist, moind ye, but a perio-dintist. Says he: 'Ye have Peoria.' Says I: 'Ye mane I come from Peoria? I do!' 'No,' says he; 'I mane ye have Peoria, the dis'ase, and 'twill cost ye five hundred dollars to be rid of it.' Well I let him go at it, and sure he got to the root of the trouble, which did not surprise me, because the dis'ase is evil, an' money is the root of all evil, and sure he got me money. Well, I'm no squeeler, so I'll cut it short. He trated me three months, and that was three months ago. An' here I am back in Peoria, and the Peoria is back in me. But me money is still with the perio-dintist.

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"WHISPER! MAYHAP I have the name wrong. Mayhap he was a period-dintist, and if I'd paid him more the cure 'period' might have been longer."

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WHETHER MY CORRESPONDENT had heard the above narrative or not, here is the problem he asked me to solve. "Have our eminent periodontists had sufficient experience in the treatment of the mouth to be able to assure patients who place themselves completely in their control, as to advice and prophylactic care, that they will never become victims of pyorrhea? Second; in cases where pyorrhea already exists, what promise of cure can be made?"

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DR. ARTHUR H. MERRITT of New York sends the following: "In reply to question one, I would say that it is my belief and experience that patients with no pyorrheal lesions, who place themselves in the care of a competent periodontist, and who will follow his instructions, can be absolutely assured of never becoming the victims of pyorrhea. There is probably no disease to which the mouth is subject, so easily prevented. If dentists would only realize that every case of gingival irritation is a potential pyorrhea, and would take steps to remove

the causes of such irritation, and at the same time would instruct their patients in the proper care of their mouths, most of those cases which now find their way into the hands of the periodontist, would never develop. There are of course other factors, such as occlusion, nutritional disturbances of the investing tissues of the teeth, possible systemic complications, etc., but intelligent care would suffice to prevent their ever becoming sufficiently potent to actually bring about pyorrhea. Under such conditions, one need have no hesitation whatever in assuring patients 'that they will never become the victim of pyorrhea.'

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"IN CASES WHERE PYORRHEA already exists, the promise of cure can, within certain limits, be made with equal assurance. That there are incurable cases, where the diseases has progressed to the point where there is no longer any bone attachment about certain teeth, or where so many have been lost as to impose such strain upon those remaining as to make prognosis doubtful, must be obvious. But where these conditions do not exist, and the teeth are vital, pyorrhea can be cured. This cannot be made too emphatic. By this is meant restoration to health, obliteration of pockets and regeneration of bone, with attachment. Anything less than this cannot be regarded as a cure. Such results cannot be obtained in cases where the teeth are pulpless, or in traumatic occlusion, or where imperfect root surgery has been practiced. The explanation for so much skepticism regarding the cure of pyorrhea is to be found, not in the incurable nature of the disease, but in the unskilful way in which it has been treated. Poor root surgery, even when supplemented by vaccines and all the nostrums so loudly advocated, never has and never will cure a single case of pyorrhea. But in those cases in which good root surgery has been practiced, proper attention given to occlusion, and the patient instructed in intelligent home care, cure follows as a natural course of events."

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DR. AUSTIN F. JAMES of Chicago writes as follows: "My answer to your first question is unqualifiedly, yes: To the second; a cure can be accomplished in all cases where there is enough bone left to support the tooth and the mechanical strain is not unduly heavy. Failure in the first case would prove the periodontist to be either a poor teacher, or a poor operator."

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DR. PAUL R. STILLMAN of New York expresses his views thus: "Prophylactic care of the mouth, as it is now understood, includes not alone mouth sanitation as practiced by the dental hygienist, but also the elimination of each of the several contributing factors which

❖ complicate the treatment of almost every case of pyorrhea. Chief ❖ among these is an acquired functional malrelation as found in the ❖ occlusion, and which includes a trauma of the pericementum. This ❖ malrelation may be induced by attrition, resulting in a loss of ❖ occlusal enamel and a coincident deformity of the normal occlusal ❖ contour, by congenital malocclusion, or by drifting of the teeth themselves. Instances of the latter are found in mouths where the loss ❖ of teeth by extraction, or by incorrect attempts to restore the occlusal ❖ surfaces by crowns, bridges, inlays or fillings have distorted the ❖ normal anatomical coördination of the occlusion. It is reasonable ❖ to believe that a patient in whose mouth the correct occlusal relations are preserved, receiving and practicing proper prophylaxis will ❖ never become a victim of pyorrhea. ❖ ❖

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"I REPLY TO YOUR SECOND question as follows: One does not ❖ promise cures. Basing prognosis upon my own experiences the ❖ percentage of cases successfully treated and cured is very high. ❖ By cure is meant a return of the tissues to normal health. Individual ❖ teeth are very frequently encountered with dental periodontoclasia ❖ so far advanced that the usual treatment is contraindicated. These ❖ teeth are extracted. I am amazed that any 'prominent dentist' ❖ would seriously ask these questions." ❖ ❖

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DON'T BE ANGRY, PAUL. My Correspondent is a prominent dentist, ❖ even if he did ask these questions. Maybe he has pyorrhea, and ❖ has not been cured. You never can tell. I even know a very prominent periodontist who has it. But then he could not treat himself ❖ I suppose, so I should not have mentioned it. Oh! Well! I take ❖ it back. ❖ ❖

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DR. A. L. HAMM of Denver, has obliged us with the following reply: ❖ "In regard to your inquiry, 'Have our eminent periodontists had ❖ sufficient experience in the treatment of the mouth to be able to ❖ assure patients who place themselves completely in their control, ❖ as to advice and prophylactic care, that they will never become victims of pyorrhea?' replying, I would say it is my firm belief that ❖ in cases where no pyorrhea exists, provided the occlusion is normal, ❖ and there are no undermining constitutional disturbances such as ❖ anemia, malaria, syphillis, metal poisoning, and other conditions ❖ of like nature; and where the patient coöperates in full harmony ❖ with the periodontist, pyorrhea will never develop. ❖ ❖

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"IN REPLY TO YOUR SECOND question, 'In cases where pyorrhea al- ❖ ready exists, what promise of cure can be made?' I might say that

❖ I never use the word 'cure,' but prefer the terms, 'control' and 'ar-
❖ rest.' In the great majority of cases where treatment is indicated,
❖ that is, where the prognosis is favorable, an arrest, or control, of the
❖ condition can be secured. ❖ ❖

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"BUT, THIS RESULT can be maintained only by full coöperation of the
❖ patients with the periodontist, which constitutes prophylactic treat-
❖ ments from time to time, and eternal vigilance on the part of the
❖ patients in their daily care of the oral cavity. Pyorrhea is not a
❖ specific germ disease; therefore, an immunity cannot be created, and
❖ the causative factors of the condition cannot be permanently elimi-
❖ nated. ❖ ❖

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"I FIRMLY BELIEVE that the periodontists have developed their tech-
❖ nique to such a degree, that, in the great majority of cases, beautiful
❖ results are obtained, and teeth doomed to inevitable exfoliation are
❖ saved to the patient, in a normal, efficient condition, for time in-
❖ definite. I trust that I have made myself clear in differentiating
❖ between a permanent cure, and a permanent control, or arrest of
❖ pyorrhea." ❖ ❖

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DR. JULES J. SARRAZIN, of New Orleans, has the following views:
❖ "If we more clearly realized that Riggs disease, like any other,
❖ results from infection, we would better appreciate the importance of
❖ minimizing microörganic life in the mouth. According to the resist-
❖ ance of tissues, it requires more, or less of it to cause disease. As
❖ we have no means other than results to measure tissue resistance by,
❖ the only safeguard is thorough, effective home prophylaxis, backed
❖ by as much chair prophylaxis as the patient's condition may
❖ necessitate. That combination, thoroughly applied, will reliably pre-
❖ vent pyorrhea, even though alveolar atrophy may in time destroy
❖ supporting tissue until a proportion of the length of roots become
❖ exposed too much for the imbeded portion thereof to withstand
❖ morsal stress. Such a condition results from dystrophia, and is
❖ amenable only to timely systemic measures, helped by physiologic
❖ gum massage. With the combination of accurate curettage of roots
❖ and sockets, effective and not destructive germicidal treatment,
❖ systemic measures against cell poisoning and destruction, and
❖ prophylaxis at home and at the chair, patients may be assured that
❖ recurrence of the disease need not be feared as long as they properly
❖ maintain their home prophylaxis. Otherwise, reinfection occurs.
❖ 'Riggs disease,' because it depicts no stage of the malady, may be
❖ taken to mean any phase of it: congestion, inflammation, or suppura-
❖ tion. It may even include etiologic infection, and applies to

dystrophia and atrophy. 'Pyorrhea' means only that stage when pus exudes."

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DR. F. H. SKINNER, of Chicago, phrases it thus: "I believe one is safe in giving a favorable pyorrhea prognosis, under the following conditions: Where teeth are in good alignment and occlusion, or can be made so. When not over half of the process has been destroyed, as evidenced by radiographs. When the pockets have not extended between bifurcated roots. When the patient has the ability and willingness to do the necessary work at home. When prophylaxis treatments are continued after the pyorrhea has been cleared up. Where pockets extend between roots of molars or bicuspids, thorough work and persistent care may make those teeth useful for a period of years, provided that occlusion can be obtained which does not produce irritation. In other words, the earlier a case is taken the better the prognosis. Ideal prophylaxis should be started before any pathological conditions have developed."

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AS PRACTICALLY ALL PERIODONTISTS agree that coöperation on the part of the patient is necessary to a perfect control of pyorrhea, the following may be quoted with advantage from an article by Dr. Eugene Talbot which recently appeared in "Oral Hygiene."

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"FROM TIME TO TIME in the past ten years I have called the attention of the profession to the fact that for many years by my methods of practice I have been able to save 30 to 40 per cent. of tooth decay in the mouths of my patients. At the present time, in that part of my practice where patients visit my office for the treatment of interstitial gingivitis at least four times a year, I can now safely say that I can and do prevent 80 to 90 per cent. of tooth decay.

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"THE APPLICATION of iodin at every visit to the teeth and gums will destroy every germ it comes in contact with, including lactic-acid germs. If lactic-acid germs are destroyed, tooth decay cannot take place. The officinal tincture of iodin, as sold in the drug stores, should not be used. My preparation of iodoglycerole, the product of many years of study, can be used every day, if necessary, without injury to the tissues. The teeth, cavities in the teeth, the gums and mucous membrane should be saturated with this preparation before the operations are begun, at one or two sittings, depending upon the filth in the mouth and sensitiveness of the cavities. This gives the operator a comparatively clean mouth and the cavities are not so sensitive to excavate.

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"IT IS TIME to call a halt on the toothbrush business. Every intelligent dentist knows that the toothbrush is a failure in preventing tooth decay. The reason of this is, that none is shaped right to perform the work and that the name 'toothbrush' limits the work to be performed. It is just as necessary that the gum-margin should be brushed and stimulated, and the food removed from between the teeth and the gums, as any other locality. The toothbrush usually hits certain prominent surfaces and rarely reaches the most important parts of the tissues.

"EVERY DENTIST CAN TRY out these suggestions in a very simple way. The most difficult cases we have to contend with are those in which the mucous membrane of the gums and lips are red, inflamed and swollen. The mucous and saliva are thick, ropy and acid. The gums festoon and bleed easily. Cervical cavities appear at the necks of all of the anterior teeth. The cavities are so sensitive that they cannot be excavated. Begin the treatment by using iodoglycerole: Zinc iodid, 15 parts; distilled water, 10 parts; iodin crystals, 25 parts; glycerine, 50 parts.

"APPLY THIS upon the teeth and gums and saturate the cavities of the teeth every day with an applicator for one, two or three weeks, until the cavities cease to be sensitive, the mouth is clean, germs all destroyed and the gums receded to nearly or quite normal. At the same time, let the patient use the following gum wash three times each day: Zinc sulphocarbolate gr. 60; alcohol oz. 1; distilled water oz. 2; true oil of wintergreen gtts. 8.

"THE SULPHOCARBOLATE was introduced to the profession some years ago by Dr. W. H. Whitslar. There has been nothing placed upon the market that will contract the gums and cleanse the mouth better than this for a gum wash. The gum wash must be applied with a stiff gum massage brush that will reach the festoons between all the teeth. The dentist must watch and direct the patient's movements at least twice a week to see that the work is properly performed, and the gums are pink and hard. At the same time application of iodin (iodoglycerole) must be made as before." 1917.

COMMENT. Today, more than ten years after the above was published, I believe that practically the same replies to the same questions would be received from the same men (and others).

PERHAPS THE SITUATION is analogous to the following. I once

said to a friend, a physician; "The ordinary cold seems to be the stumbling block to your profession!" "Why so?" he asked. "Because," said I, "you medical gentlemen do not seem able to 'cure' a cold!" "Oh yes we can," he answered, "provided that we have the patient's coöperation. If at the onset of a cold, you will go to bed, call me in, take my medicines, follow my directions, and stay in bed until I tell you that you can get up, I will 'cure' your cold. But the majority of patients, especially men, want to take a tablet, or something out of a teaspoon, go about their daily work regardless of weather, and still get well.

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"THE REASON WHY we can cure tonsilitis, and fail with a slight head cold, or cough, is because with tonsilitis the patient is too sick to get out of bed."

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SEEMS TO BE much the same with pyorrhea (periodontoclasia). The patient apparently would rather buy a bottle of "Nomorepyorrhea," or some other similar nostrum, and use it for a minute or two, every morning and night, than to have himself treated by a regular periodontist, especially if the early morning visits cause him to miss the opening of the stock market, or of his mail. 1928.

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XXVI.

MANY EXPRESSIONS of commendation have come in regarding the Table Talk reported last month. I feel therefore that we cannot do better than to begin where we left off, as it were. Just too late to be included in the report, we received the following exceedingly rational communication from Dr. G. M. Gearhart of Washington, D. C. He writes as follows:

"AN EXPERIENCE OF EIGHT YEARS devoted to periodontology has convinced me that patients having a marked predisposition to pyorrhea have prevented further manifestation of that condition by presenting themselves for prophylactic treatments at stated intervals. The frequency of treatment should be somewhat dependent upon the rapidity with which calcareous deposits form, and upon the ability of the patient, daily, to render such personal care to the oral cavity as may be indicated to keep it in a state of health. The success of prophylactic treatments without the hearty coöperation of the patients in caring for their mouths is greatly impaired, but if the periodontist is enabled to work hand in hand with the patient, I confidently believe that the patient can be assured that he will never become the victim of pyorrhea.

"YOUR SECOND QUESTION, 'In cases where pyorrhea already exists, what promise of cure can be made?' is exceedingly difficult to answer. The prognosis of pyorrhea, among other considerations, is governed by the extent of the disease. The fact is that in the past, overzealous attempts to cope with irreparable conditions at the outset, and the subsequent failure to perform a miracle in the attempt to save the teeth, have done much to cause the members of the profession as well as the laity, to question the claim that pyorrhea is curable. The successful treatment of pyorrhea may be likened somewhat to the successful treatment of tuberculosis. There are hundreds of cases on record of the complete cure of tuberculosis, and thousands of cases on record showing marked improvement in this malady. The success of the cure or improvement varies with the greater or lesser degree of ravages made before treatment is undertaken. The fact that one case has been cured proves, without a doubt, that the disease is curable, even if it never is cured again.

"MANY PYORRHEAL CASES that have involved a loss of the alveolar process to the extent that the teeth were mobile, accompanied by a hyperemic condition of the gums and a rich extravasation of pus, have yielded to intelligent surgical interference to the extent that the teeth have become firmly fixed, the discharge of pus has disappeared, the congestion has been relieved and the teeth made comfortable and capable of performing effectual masticatory functions.

"I AM SOMEWHAT IN DOUBT of the advisability of 'promise of cure,' as stated in the query, both from the practical and ethical standpoint. Such a statement smacks of the 'guarantee' that has been frowned upon when made to apply to any dental operation. If one must venture a prognosis in the cure of pyorrhea, it will be based, first, upon the periodontist's experience in grasping the situation as to the extent of the alveolar loss; and second, knowledge of his own ability to perform the necessary operations required. Operators possessed of these two requirements who conscientiously perform their duties, may confidently claim that pyorrhea can be cured."

I JUST COULD NOT resist the temptation to print the above, but if I stop there it makes a pretty short talk; yet I hate to do all the talking myself, especially not being a periodontist, or rather a periodontologist. They are not the same, you know. The periondontists are the men who can actually do the work, whereas the periodontologists just know how to talk about it, and the latter outnumber the former by—Oh, well! I hate to be too accurate.

SO IN SPITE of my known lack of loquacity, I see no way to make this conversation long enough without dipping into the subject a little myself.

I WONDER if it would surprise the periodontologists to have me inform them that there is an important subject that they have not yet written about? Fact! Now I believe that if a good periodontologist would collaborate with a good periodontist, with perhaps a few hints from an ordinary dentist, a valuable paper might be the result.

ADMITTING THAT I am neither the first nor the second, perhaps as the plain ordinary dentist I may throw out the suggestions; write the scenario as it were, and thus tempt some competent couple to give us the real dramatic story.

FIRST THEN COMES THE QUESTION of the title. And do you know the title is really very important; more so than many of you

think. Many a really good paper is left unread because the title is as far as the reader gets. For example; You see a paper headed; "Cavity Preparation for Inlays." Do you read that paper? You do not. But suppose the title was; "A Cavity Preparation Which Will Prevent an Inlay From Being Dislodged." You read that one, do you not? I guess so. Why? You do not read the first paper because by the title you decide that you know all there is to know about the subject. But the second title is different. You conclude at once that the writer is a liar. It can't be done! Therefore, you want to know how he does it. Get the idea?

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VERY WELL THEN! We need a title that will catch the eye; arrest the attention; excite the curiosity. If we can suggest that we are going to tell the reader something that he does not know, something that he wants to know, so much the better. What title then shall we choose? How would this do? "The Treatment and Cure of Inflamed Interproximal Tissues Prior to Filling." Outlines the subject nicely; suggests a new thought, viz.; cure the soft tissue before treating the hard; promises to tell you how to do all this. Pretty good, don't you think?

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OR PERHAPS YOU WOULD like this one better; "The Management of Margins" (sounds good; nice alliteration); "The Management of Margins Lying Beneath Gum Tissue." Every dentist wants to know how to do that, and so few do know, that we ought to have thousands of readers. Going to interfere a little with the periodontist's practice, because when dentists learn how to fill teeth without injury to the soft tissues, about sixty per cent. of the periodontist's practice will cease to be. But what of that! You fellows can live on forty per cent. of your present fees, can't you? Sure you can.

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WELL, WE HAVE made a start, we three collaborators. We have two titles to choose from. Next question is how much shall we tell them? I guess we could tell all we know and still keep the paper short enough to be attractive. Did you ever notice how hard it is to get a paper really started? Somehow we always imagine we need some sort of an introduction, but the fact is, the introduction just annoys the reader; moreover if you make that introduction long the reader may never get beyond it. Best method is to eliminate the introduction altogether. No need to tell them how little previous writers have written; nor how little they have known; nor how thoroughly we have studied the question; nor how successful we have been; nor how happy our patients are! Suppose we just skip all that and get down quickly to what the reader wants to know.

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WHAT IS IT THAT the reader does want to know? Why what we promised to tell him of course. We promised in one title to tell him how to cure inflamed gum tissue, and in the other we engaged to teach him the management of margins lying beneath the gums.

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THEREFORE, WE SHOULD START something like this: "When the margin of a cavity is found to lie beneath the gum—" Get the idea? No introduction. We do not stand shivering on the dock fearful of the cold water; we plunge right in and commence swimming. And Lo! We have our reader hypnotized at once. He is so astonished to have us start telling him right away, that he just reads right on. Hence, of course, we must write right on.

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WHEN THE MARGINS of a cavity are found to lie beneath the gum two conditions may prevail. The soft tissue may be already in an inflamed or diseased state, in which case this inflammation or disease should invariably be removed prior to placing a permanent filling. Or at times the gum may be healthy, in which case it is of paramount importance to so handle the case that we produce neither inflammation nor other disease.

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LET US THEN FIRST consider those cases where the cavity margin is hidden by healthy gum tissue. At the first sitting, as much decay should be removed as possible, without wounding the gum. Hand instruments are safer than engine tools, because with them there will be less danger of causing the gum to bleed. It is not essential at this time to actually prepare the cavity. Indeed it may be dangerous to do so. Cavities occurring at the buccal, or labial, gum margins should be handled with special caution, as injury to the gum at this point will induce recession.

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RECESSION OF THE gum is bad in any place. It is bad on the labial and buccal surfaces because the exposure of the neck of the tooth usually results in staining of the soft cementum, producing unsightly appearance. Recession between the teeth increases the interproximal space. That is to say it produces an interproximal space. The interproximal space really means the space seen in the skeleton. In a state of health the "space" does not exist as a space, because it is filled with gum tissue. Therefore, just in proportion as there is an interproximal space in the living subject may we say that a pathological condition prevails.

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INJURY OR INFECTION of the gum margin therefore always invites disaster. At the visible situations it produces unsightly exposures

of the root, often accompanied by painful sensation. Moreover, recession of the gum in these situations is usually progressive, the use of the toothbrush often aggravating the disturbance. Recession between the teeth, by creating interproximal spaces, induces the impaction of food with constant irritation and possible infection of the gum septa. Hence recession here is likewise progressive.

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IT IS THEN THE MANIFEST DUTY of the dentist never to injure the gum margin.

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IN DEALING with cavities beneath the gum margin on buccal or labial surfaces, the cavity should be cleansed of decay as far as possible by hand. A ligature is then passed around the neck of the tooth, the free ends lying loose. The cavity is protected from moisture with cotton rolls, and dried thoroughly with warm air blasts. The gum is then pressed out of the cavity with balls of cotton, using larger and larger pieces until in a few minutes the gum stands away from the cavity. The cavity is then packed with temporary stopping which is quickly tied in place with the silk ligature. The silk should not be the silk used for cleansing teeth as that stretches when wet. Tie with silk used by orthodontists as that contracts and therefore tightens. Before the temporary stopping has hardened, with a warm ball burnisher, gently force the stopping well up and under the gum.

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USUALLY AT THE next sitting the gum will have been forced away, without injury, sufficiently to permit placing the rubber dam and a clamp. Occasionally a second treatment with the packing of temporary stopping may be needed. Sometimes even if the regular cervical clamp cannot be used, the margin may be exposed and the rubber dam kept in place with a needle or a steel pin, gently driven into the dentin. Care should be observed not to drive the needle in too far, but it is remarkable how well the dam may be kept above the cavity margin with a needle driven in only to a very slight depth.

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WHETHER GOLD OR A SILICATE be used the polishing at the gum festoon should be done before removal of the dam, as otherwise the sandpaper disks are apt to injure the gum. Use the disks therefore while the gum is protected by the dam. Rub a little vaseline on the dam to avoid cutting it with the edge of the disk.

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APPROXIMAL CAVITIES, the gingival margins of which lie beneath the gum, should be handled somewhat similarly, yet with a difference. The cavity should be cleaned out as far as possible without causing the gum to bleed. It should then be dried out thoroughly

and packed first with cotton steeped lightly in sandarac varnish. This cotton is used to force the gum away from the cavity margin, and it is then protected by filling the rest of the cavity with temporary stopping. Between visits the cotton will expand and force the gum further aside.

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IF THERE IS DIFFICULTY in drying out the cavity without the dam, the dam should be used, but at least four holes should be cut and the end hole should be made with the largest punch. At times it may be necessary to enlarge this hole by cutting two close together and snipping the bit of rubber between the two. In placing the dam, this large hole is stretched over two teeth, so that no rubber passes down against the gum at the margin to be treated. This, of course, will not produce complete dryness, but will greatly facilitate management of the case in a wet mouth, and the parts can be kept dry enough for all practical purposes.

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AT THE SECOND SITTING a copper band should be adjusted to the tooth and cemented to place. At the approximal side, where the margin lies beneath the gum, the band should be cut to an accurate curve so as not to impinge on the gum elsewhere, but yet extend down and embrace the gingival margin of the cavity which has been exposed by the packing. Before setting this band, the extreme edge of the curved extension, which is to embrace the cavity margin, should be inverted, or bent toothwise. This really makes the band fit more tightly and at the same time presents a curved edge or rounded surface against the soft tissue.

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WHILE FITTING this band, it should also be burnished tight against the adjacent tooth so as to form a good approximal contact, and thus obviate food impaction. The band should be set with fairly stiff cement so that it may harden quickly. The cavity then is filled with gutta-percha and the case left for at least a week, or until such time as the gum becomes normal and accustomed to its new position.

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BUT THERE I HAVE GONE rambling on just as though I meant to write the whole paper. Well I have given a few suggestions as to management of margins when the gum is fairly healthy, and I admit that I have said nothing about those cases where the gum is already in a state of inflammation or infection. But then I should leave something for my periodontic and periodontologic collaborators. Don't you think so?

1917.

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XXVII.

THINK I TOLD YOU last month that I would not be permitted to drop the subject taken up in July. Fact is I have had a letter, two letters, from Dr. E. F. Izin of Alliance, Ohio, in which he makes some cogent comments, thuswise:

"IN YOUR TABLE TALK you hold it to be the manifest duty of the dentist never to injure the gum margin; to which I say Amen! After having forced gum tissue out of deep-seated approximal or buccal cavities without injury to the gingiva, you then state that the rubber dam and clamp can be adjusted (without injury, of course, you mean).

"BY WHAT PROCESS can the foregoing be accomplished? I maintain that it is practically impossible without working injury at one point or another around a tooth containing a deep-seated approximal or buccal cavity. The adjustment of the clamp in such cases, to my mind is one of the most prolific causes of gum recession (plus subsequent pathologic conditions) in present day practice of dentistry.

"THE MECHANICAL SEPARATOR and the cervical clamp are also workers of iniquity.

"IT SEEMS TO ME THAT it would be a much more sane procedure to force out the gum tissue, then maintain dryness as best you can (without the rubber dam) and properly fill; with alloy if necessary; because the injury to the gingiva otherwise is infinitely greater than all the bacterial action which might occur when placing a filling without absolute dryness.

"THE FACT THAT many teeth filled with alloy before the days of the rubber dam have played their part successfully for years, is sufficient evidence that absolute dryness is not mandatory for the proper conservation of disabled organs of mastication. The fact that some dentists frown upon alloy, advocating gold only, causes me to mention that many men behind the steering wheels of automobiles would be far more successful in the rear of a wheelbarrow."

THERE IS ANOTHER LETTER from Dr. Izin, but let us pause and discuss the points raised. He asks one definite question. He reminds me that in the talk under discussion I advocated gently forcing away the soft tissues to expose gingival margins, and that then I spoke of using the rubber dam and clamps. Dr. Izin asks how this may be done without injury to the soft tissues.

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TO REPLY ONE MUST deal with specific cases. But first let me say that to my mind it would be more logical to say: "You cannot use a clamp without injury to soft tissues, where the cavity margin is below the free margin of the gum, unless you force the gum away," rather than to claim that it cannot be done after forcing the tissue away. As a matter of fact the primary object of forcing the tissues away from the cavity margin, is that the margin itself may be exposed, and the clamp adjusted without injury to the gum.

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DEALING NOW with specific cases the cavities must be divided into two classes; those so situated that the clamp must be placed upon the tooth in which the cavity is found; and second, those in which the clamp may be adjusted about some other tooth. In this latter class of course the possible injury by the clamp has no relation to the cavity from which tissue has been forced away, because the clamp is on some adjacent, or even distant tooth.

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MY LONG DISTANCE PHONE connection is not very good to-night, but I think I hear Dr. Izin remark: "It is just as bad to injure the gingiva about a sound tooth as about one that has a cavity." Quite so! Very well, then, pardon a little Irish bull. There are many teeth about which a clamp can be adjusted without injury; and where this can't be done, it can be done. It can be done as follows:

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LET US PRESUME that the tooth to be filled is a first upper bicuspid. Punch four holes and slip these over the lateral incisor, the cuspid and both bicuspids. With a smooth-edged burnisher evert the edges of the dam to fold beneath the free margin of the gum. No injury as yet, what? Now for the clamp. Draw the rubber dam tight over the molar tooth, just as though there were a hole in the rubber, only there is no hole. When this is stretched so as to fully disclose the molar tooth under the rubber, adjust a molar clamp, one of the proper form, over the rubber dam which is over the molar. The dam is nicely held in place, and the clamp neither injures the gum nor causes pain. Don't take my word for this. Try it and your patients will be grateful.

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THIS BRINGS US to the difficult cases; those where we must apply the dam clamp to the tooth in which the cavity exists. And this clamp must be used so that the patient will not call it the "damned clamp." In other words, the saliva must be dammed, but not the clamp. Let us see! What sort of case shall we treat first? Seems to me, somewhere Dr. Izin damns the cervical clamp. Many dentists and many patients have done the same. But why damn the clamp? Why not alter it so that it will became a factor in painless dentistry? Simple, I assure you. Trouble with most cervical clamps is that they have two sharp points, usually the terminals of a semi-lunar edge, which none but a loon would expect would fit more than one or two teeth in a hundred. Usual result one sharp point on the tooth, and the other hurting and injuring the soft tissue.

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RESHAPE THIS CLAMP! Grind the two points into a single point. Make this sharp and slightly curved gum-wards. Suppose now that we have used temporary stopping to force the gum away from the gingival margin of a labial cavity in a lateral incisor. Removing the temporary stopping we note that the cavity margin is now nicely disclosed. If not, a second treatment with the temporary stopping would be expedient. Holes are properly placed in the dam, so that when in position the interproximal gum tissue would be covered by the dam. This necessitates placing one hole slightly out of alignment. The dam is drawn over, say four teeth, and stretched so as to disclose the gum that has been pressed out of the cavity. The tender gum then being in plain view, the single-toothed clamp is carefully placed so that the sharp point of the clamp rests upon the tooth neck just above the cavity margin, but does not impinge upon the soft tissue. Warm air is now used and the parts thoroughly dried. Then, if desirable, with a stout instrument you may press gently but firmly against the clamp forcing it higher up, disclosing more of the tooth neck above the cavity margin and compressing but not injuring the soft tissue. This can and should be done painlessly, without shedding a drop of blood.

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IN CASES WHERE the operation will consume but a short time, and no cervical clamp is at hand which will properly fit at both the labial and palatal surfaces of the tooth, a not uncommon circumstance, the dam can be kept above the cavity margin, without injury to tooth or gum by gently forcing the dam to place with a steel needle or pin, and driving the point of the needle into the dentin above the cavity margin.

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OR BY ANOTHER METHOD we may achieve the same result. A silk,

❖ well waxed, may often be tied above the cavity margin. In such ❖ case the end of the silk should be left six to eight inches long, and ❖ may be passed up over the forehead, (or chin if a lower tooth), a ❖ napkin protecting the face, and a heavy weight attached to it will ❖ hold the dam in place nicely while giving free use of the hands. ❖

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NEXT LET US CONSIDER buccal cavities in lower molars. Can not do ❖ better than describe a novel method which I was forced to adopt ❖ in a case this week. Cavity in the buccal surface of a second lower ❖ molar; very sensitive and mouth very wet. Packed gum out of cavity ❖ and well away from cavity margin, by two treatments, using tem- ❖ porary stopping, tied in with silk; then softened with warm burnish- ❖ ers and pressed home. ❖ ❖

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WHEN THE GINGIVAL MARGIN was well disclosed, a copper band, ❖ just a trifle too small in circumference, was forced over the molar, ❖ and manipulated with band-forcing instruments, (such as are used ❖ by orthodontists), so that the band was actually stretched to place. ❖ By this means it passed beneath but did not impinge upon the gum ❖ margin. In the buccal region of course the first application of the ❖ band covered and consequently hid the buccal cavity from view. ❖ This part of the band was cut away sufficiently to disclose the upper ❖ half of the cavity. The band was then forced back to place. The ❖ rubber was put on and the clamp adjusted without injury or pain, ❖ after which the upper edge of the copper band, which still hugged ❖ the region of the cavity somewhat, was forced outwardly, the soft ❖ metal yielding nicely, and the cavity was then readily prepared and ❖ filled. And I believe I may say prepared and filled with that ❖ thoroughness that never could have been accomplished without the ❖ dam. ❖ ❖

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YES I KNOW, I did say the cavity was sensitive. Such cavities usually ❖ are. All the more reason for the dam. How would you prepare ❖ such a cavity without pain, if you did not resort to the rubber? ❖ With the rubber dam in place I easily used chlorid of ethyl and ❖ the preparation of the cavity was absolutely painless. Of course ❖ there was some little shock and pain when using the chlorid of ❖ ethyl but that is momentary and transitory. ❖ ❖

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BUT DR. IZIN SPOKE OF approximal as well as buccal cavities; so we ❖ must consider them also. Approximal cavities extending below the ❖ gum margin occur either in teeth having living pulps, or in teeth in ❖ which canal treatment is requisite. In the latter case the rubber ❖ dam is absolutely a prerequisite to anything even approximating an

❖ aseptic operation. The recourse then must be the use of the copper
❖ band. The gum is generally inflamed, or otherwise diseased when
❖ we start treatment. We need only to inaugurate a technique which
❖ will not increase the disturbance, but rather offer opportunity for
❖ improvement. ❖ ❖

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IN FITTING THE COPPER BAND select one a bit too small rather
❖ than one a bit too large. Festoon the band at the interproximal
❖ aspect so that it may be forced beyond the interproximal cavity
❖ margin, without injury to the gum tissue elsewhere about the tooth
❖ neck. The extreme edges of the band should be inverted, bent
❖ toothwards, so that it shall present a rounded edge to the soft
❖ tissues. A properly formed and fitted band cemented to place, and
❖ left on until all canal treatment and filling shall have been com-
❖ pleted, will usually give the gum ample opportunity to heal, and
❖ when removed will not only disclose the cavity margin, but will permit
❖ preparation of this margin without injury to the gum. ❖ ❖

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IT WILL OFTEN OCCUR, however, that the recession of the gum inter-
❖ proximally, will be so deep that if the dam is used the septum of
❖ rubber lying between the teeth cannot be made to dip downwards
❖ to include the cavity margin. This sort of cavity, as well as those in
❖ which the pulps are found alive, and which are to be filled without
❖ resort to the copper band, may both be managed in like manner.

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SUCH CAVITIES USUALLY being large, are not nowadays filled with
❖ anything but gold inlays or amalgam. Hence absolute dryness for
❖ an extended period is not necessary, as it would be for a gold foil
❖ filling. The technique, therefore, is quite simple. A single hole in
❖ the dam, made with the largest punch, is stretched over two teeth,
❖ the one with the cavity, and the one immediately adjacent thereto.
❖ Thus, the cavity margin is in plain view, the cavity is kept quite
❖ sufficiently dry, the lips and tongue are kept out of the way, and the
❖ operation proceeds without injury to the tissues. ❖ ❖

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NOW WE MAY AS WELL close with that other letter from Dr. Izin, be-
❖ cause it is a very nice letter. I always like a man to say compli-
❖ mentary things about another man. And then again as the phone
❖ connection has been broken for the night, I ought to let Dr. Izin
❖ have last word. He writes as follows: ❖ ❖

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"DR. FRANK DOUDS of Canton, our county seat, may have equals in
❖ the art of manipulating gold, but I feel sure he has no superiors.
❖ He has not used a mechanical separator in eighteen years. Yet he

❖ has to his credit the most beautiful contours and monumental
❖ restorations with gold, in anterior and posterior teeth, upon which
❖ the eye would desire to gaze. These were all 'inlaid' of course (with
❖ the hand mallet)." ❖ ❖

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WELL, I MAY NOT class up with Dr. Douds as a gold contourist, but I
❖ can beat his record on the mechanical separator. In all my ex-
❖ perience, (I will not set down the number of years, but it has been
❖ more than eighteen) I have never used a mechanical separator on a
❖ patient. You see, (fortunately for my patients) one of the original
❖ inventors, used me as clinic material at a society meeting for
❖ demonstrating the ease (sic!) with which he could separate teeth.
❖ It sure was easy, that is to say, it was easy for the Inventor Man.
❖ But personally I remarked: "Never again!" and that was not a
❖ slang phrase at the time either. Just a heartfelt extemporaneous
❖ expression of deep-seated feeling. But let us get on with Dr. Izin's
❖ letter. ❖ ❖

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"THE GUM RECESSION problem I must admit makes me shudder, and
❖ grow cold at heart. How many of us have seen absolutely no re-
❖ cession where teeth have been carrying crowns that fit like a blanket
❖ over a hitching-post; and in the next hour we observe a case where
❖ teeth carry crowns that fit like the proverbial paper on the wall, yet
❖ the gums have receded, fully disclosing the upper edges of the
❖ crowns! ❖ ❖

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"THEN AGAIN, LET ME STATE that if the deposits taken from my
❖ teeth in the past fifteen years could be hung around the neck of a
❖ mosquito on the high seas he still would be able to float. Neverthe-
❖ less I am the victim of gum recession, especially around teeth free
❖ from dental restorations, as well as around those that carry crowns
❖ or fillings. Can you explain?" ❖ ❖

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DON'T REALLY BELIEVE I CAN, but any member of the Club that
❖ thinks he can tell us "Why, when, and wherefore gum recession,"
❖ will now please step up to the desk, and speak out real loud so we
❖ all can hear him. 1917.

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XXVIII.

THE CHAT THIS MONTH will be almost chatter. During the summer months quite a number of the Club members have sent in comments or criticisms and several of these appear of sufficient interest to be spread upon our minutes for open discussion. "And the first shall be last," hence presumably the last should be first. This is a letter from Dr. Izin, who is inclined to think that he was not correctly quoted last month. Of course nothing was farther from our thought. Sometimes in altering a letter to pure colloquial form, the translation may not be entirely satisfactory to the original writer. We are, however, always glad to make amends, as now, by giving the writer last say. Dr. Izin writes:

"INASMUCH as there were some changes in the wording of the letters sent you the writer was at a disadvantage. Let me say then that after reading the last Table Talk I still maintain that the proper adjustment of the clamp to a tooth containing a deep-seated approximal, labial, or buccal cavity is bound to cause injury to the soft tissues at one point or another. The very purpose of a cervix clamp is to force the gum tissue away from the field of operation. I hold that one need not actually lacerate the gum with the clamp in order to inflict injury. Is it necessary for me to offer proof of my statement that teeth have been successfully restored to usefulness without obtaining absolute dryness during the actual process of restoration? I think not. In short, I fully agree with the axiom presented in the July talk: 'It should be the manifest duty of the dentist never to injure the gum tissue.'"

WELL, THAT SEEMS to be a safe point at which to close the discussion.

IT IS NICE TO KNOW that we reach even the far places in this little world of ours. Appended therefore is a communication from a new Club member, Brother E. L. Hutchinson, of Honolulu, Hawaii. Unfortunately we have not received the sample inlay mentioned, but it is apparent that the method involves casting into a matrix, which is rather a subversion of the casting method, since it was offered to the profession as a means of obtaining a more accurate

adaptation to the actual cavity walls than could be obtained by the old matrix method. However, the method may help some, and we present it with pleasure. Dr. Hutchinson says:

"WHEN MILES STANDISH wanted John Alden to propose for him, he said Caesar was a writer and a fighter and could do both equally well, but that he was only just a fighter. Well, that is how I feel when I want to write to you—after reading 'Around the Table' in the April number of 'Dental Items of Interest.' For that reason I am sending you a model which I think will explain my idea of the real sensible way of making a perfect M. O. D. inlay—the last word in fact, I think, in the M. O. D. controversy. The matrix may be made either of pure gold or of platinum, the contour built up with inlay wax and cast in the usual way; or the matrix may be invested and the contour regained with 22K solder. You will readily see that the tooth capped in this way will be insured against fracture in case the inlay is used for bridge abutment. With best 'Aloha Nui' from one who is a great admirer of your interesting magazine, sincerely yours, etc."

THIS SEEMS TO BE THE PSYCHOLOGICAL time and place for the presentation of a communication which has been resting in a pigeon-hole for some weeks. Dr. Taggart has always declared that he would rather teach a dental assistant, or a dental "office girl" the casting process than to undertake the training of a graduate dentist. Trouble with the regular dentist is, he knows so much, or thinks he does, that he will neither accept nor practice the casting method as it has been given to him. The "office girl," however, has not the temerity to add to, nor subtract from what she is taught. Thus by strictly obeying instructions she learns to adopt a system which traverses identical steps at all times, the results thus being invariable.

RECENTLY THIS MATTER has been subjected to a test. A young woman who never had made inlays, who did not know an M. O. D. inlay from a nut sundae, was sent to Chicago for a course of instruction. After two weeks' experience she was told to write a description of the casting method, as she understood it. We append her own language, and only have this comment to make. The dentist with whom she is associated declares that her inlays "fit," even M. O. D. inlays, and the latter are neither cast into matrices nor are the wax patterns shaved off on the cavo-surface, to counteract shrinkage.

JUST A WORD ABOUT SHRINKAGE before presenting the young

❖ woman's description of the technique. It is declared that gold ex-
❖ pands when heated and therefore contracts in cooling. From this
❖ is deduced the fact that since gold must contract in cooling, the
❖ M. O. D. inlay must come out of the flask too short in its mesiodistal
❖ diameter to permit seating. Let us pass that for a moment, and
❖ glance at the problem from another angle. ❖ ❖

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GOLD CONTRACTS IN COOLING, yet, my Brother, have you not
❖ often produced inlays that woud not enter a cavity having surround-
❖ ing walls because of the fact that your inlay came from the flask too
❖ large? Quite so! Yet gold contracts in cooling, does it not?
❖ What is that? The mold must have been expanded? Well, there
❖ you are! ❖ ❖

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IF IT BE TRUE that gold contracts when cooling, and who denies that?
❖ And if it be true that with an expanded mold, the inlay, in spite of
❖ such contraction may be larger than the wax pattern, is it not evi-
❖ dent that there must be a method by which the mold will be ex-
❖ panded just sufficiently, so that the gold, contracting as it cools,
❖ assumes just the form and size of the original wax pattern? Why,
❖ of course, it must be so. Very well, then, let an "office girl" tell you
❖ how she does it. ❖ ❖

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"UPON RECEIVING THE wax pattern of an inlay, heat the end of a
❖ sprue former sufficiently so that it may be attached firmly to the
❖ pattern. Place it preferably at one end of the longest diameter of
❖ the pattern. Wash the surface of the wax thoroughly with acetone
❖ before attempting to place any investment. Then place the sprue
❖ former in the hole in the base, and set it firmly. ❖ ❖

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"MIX THE INVESTMENT (TAGGART'S) for five minutes, constantly
❖ rotating the mixing bowl during the process. The mixing bowl
❖ should be absolutely clean, as remnants of the old investment if
❖ left on its surface will alter the character of the new mix, and in-
❖ terfere with results. ❖ ❖

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"PAINT THE INVESTMENT onto the surface of the inlay, carefully
❖ and slowly, using a small brush. Use a thin part of the investment
❖ and coat the inlay, pushing the brush always in the same direction,
❖ thus avoiding the formation of air bubbles, which, in turn, would
❖ produce little balls, or beads, on the surface of the gold. Continue
❖ this until the investment thickens just enough to leave a complete
❖ coating on the wax. Then add more investment, taking up more on
❖ the brush and thus coating it more thickly. When the pattern is

completely covered with a thick coating of the investment, put the ring in place and pour in more investment, letting it run in slowly and rise up and surrround the pattern gradually, till the ring is full. If any water is seen oozing from the bottom of the ring, remove it gently with blotting paper.

"THE INVESTED PATTERN should be burned out within an hour of investing as this stops all chemical action and avoids distortion of the mold.

"IN BURNING OUT the flask it should be placed sprue hole uppermost, three inches from the top of a three-quarter-inch flame for five minutes. This should be followed by twice this amount of heat for ten minutes, or all the heat that the flask will stand without causing the wax to boil up through the sprue hole. When this occurs, steam boils with the wax and causes distortion of the mold. The last stage is to use the full flame for five minutes, or until a little flame burns out of the sprue hole.

"THE EXCEPTION to the above is in connection with small inlay patterns which require ten minutes at full heat. The first heating crystallizes the investment; the second draws the wax into the investment, and the third burns it out. Naturally it takes a longer time for the heat to reach the space made by a small pattern, than in one made by a large pattern.

"TIME THE BURNING out of the invested inlays with an alarm clock. Such clocks may be had, which can be set for five, ten, or more minutes. The ringing of the alarm will remind you to change the flow of gas for the next stage. Full directions for setting the clock come with it.

"TO REMOVE THE BASE AND SPRUE FORMER heat slightly over the flame. Hold the flask with sprue hole downwards. This will avoid all possibility of dropping a scrap of investment into the pattern cavity.

"NEVER USE THE REMNANT of a previous casting for making a new inlay without thoroughly refining the gold. It really pays never to use gold a second time, as gold cannot be refined as well by a dentist as by an expert gold refiner. Gold can be obtained in nugget form, and a fresh nugget used for each casting. The remnants can be returned to the gold dealer, who will give credit for them. The small difference between the buying and the selling price

❖ of these gold nuggets is more than covered by the advantage of ❖ knowing that your gold is always right for casting. Anyway, never ❖ use 'office scraps,' trying to refine them yourself. If you do, you are ❖ not using identical methods and materials all the time, and of course ❖ will not get even results. Therefore always use the same grade or ❖ karat of gold. ❖ ❖

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"IN CASTING, AVOID OVERHEATING the flask. Arrange the flame ❖ so as to have a perfect mixture of gas and nitrous oxid. There ❖ should be no smoking. The flame should be short, blue and very ❖ intense. This will boil the gold without unduly heating up the flask. ❖ Having found the right flow of illuminating gas it would be a ❖ good idea to set a stop-pin in the gas outlet so that it could always ❖ be opened to just the same flow. Then open the valve until six ❖ pounds of nitrous oxid is registered. As soon as the gold actually ❖ boils, make the cast with a rapid throw of the lever. ❖ ❖

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"TO THOROUGHLY CLEANSE the gold, leave it in hydrofluoric acid ❖ over night." ❖ ❖

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NOW, BROTHERS, if you want inlays that fit, let your "office girl" try ❖ this method. It probably would not work out if you attempt it ❖ yourself—because—you know! 1917.

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COMMENT. May I call attention to the fact that as long ago as 1917 ❖ I said: "If it be true that gold contracts when cooling, and who ❖ denies that? And if it be true that with an expanded mold, the ❖ inlay, in spite of such contraction may be larger than the wax pat- ❖ tern, is it not evident that there must be a method by which the ❖ mold may be expanded just sufficiently so that the gold, contracting ❖ as it cools, assumes just the form and size of the original wax pat- ❖ tern?" ❖ ❖

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AND NOW IN 1928, in the Journal of Dental Research for April, Dr. ❖ F. S. Meyer, of Minneapolis, Minn., describes a technique by which ❖ he does exactly that, which I declared to be essential to the making ❖ of accurately fitting M. O. D. inlays. He describes his method as ❖ follows: ❖ ❖

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"BRIEFLY, my technique for investing a wax pattern, and eliminating ❖ the wax and the moisture from the mold, is as follows: Fill the ❖ groove on the crucible former with beeswax. Then insert a little ❖ beeswax into the sprue hole, and insert the sprue supporting the

❖ wax pattern. This will prevent the wax pattern from moving when
❖ being painted with investment. Place about a cubic inch of Meyer's
❖ investment at the right end of a large glass slab. Fill the large end
❖ of Taggart Scales with Taggart investment, and balance with warm
❖ water. ❖ ❖

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"NOW NOTE THIS VERY CAREFULLY: If the wax pattern to be
❖ invested is for a full crown, use the water in the bottle in the wax
❖ expander at about 135° F. If the wax pattern is for a bulky M. O. D.
❖ inlay, dilute the water to about 120° F. If it is for a thin
❖ M. O. D. molar inlay, a M. O. D. inlay for a bicuspid, a M. O.
❖ or a D. O., any small inlay, or a three-quarter crown, do not use
❖ water over 100° F. Make the mix in the small bowl fitted to the
❖ wax expander. Stir enough with a spatula to see that the mix is
❖ of the right consistency, a heavy cream, and complete the mixing
❖ in the recess provided for the bowl in the wax expander. Leave the
❖ whip-mixer in the bowl until the wax pattern has been covered with
❖ the inner investment. From a water syringe place a quantity of
❖ water on the glass slab covering a space about the size of a dollar,
❖ or a little more. With a spatula make a mix of water and Meyer's
❖ investment of such a consistency that it can be piled up fairly high
❖ without flowing. Draw off about a third of this, and add to it
❖ more investment powder until it is as heavy as you can conveniently
❖ paint on your wax model. After painting a little of this on the
❖ cavity side of the wax model, rasp the crucible former with a file.
❖ Paint on more of the heavy investment and rasp again. This causes
❖ the heavier particles of the mix to settle, producing a dense surface
❖ next to the wax model. It also causes the bubbles and water to rise.

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"THEN PAINT the rest of the wax pattern with the thinner inner mix,
❖ covering it to the thickness of about 1/16 to 1/8 inch, or a little
❖ more, and fill in clear down to the crucible former. With a rotary
❖ motion place the warm ring taken from the wax expander, into
❖ the groove on the crucible former. The beeswax in the groove will
❖ seal the joint. Make a couple of turns of the whip-mixer and pour
❖ the outer investment. ❖ ❖

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"PRACTICE HAS SHOWN that by lengthening the time of elimination,
❖ in case a crown is to be cast, you will to a large extent obviate
❖ trouble. If an inlay, remove the mold from the eliminator while
❖ still a quickly disappearing cloud appears on the mirror when placed
❖ against the open end of the mold. The elimination of the moisture
❖ should take from sixteen to twenty minutes, varying, of course, with
❖ a slight change of temperature of the eliminator and with the size

❖ and shape of the wax pattern. Before casting, place the mold in
❖ the wax expander for from three to five minutes, to allow any trace
❖ of invisible smoke or vapor to escape. ❖ ❖

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"IF THIS PROCESS is carried out carefully, one can cast a M. O. D.
❖ molar inlay, or a full shoulder crown, smooth inside and outside,
❖ that will go clear to place with finger pressure on a porcelain model
❖ every time." 1928.

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XXIX.

HAVE YOU EVER NOTICED that when you have a great deal to say, you scarcely know where to begin? George Eliot, in prefatory remarks to one of her novels once said that as no story has any real beginning nor ending, an author is privileged to begin in the middle, or, to be more classical, **in medias res**, so to speak.

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THE SUBJECT ON THE TABLE to-night deals with fixed versus removable bridgework, and more especially mobile versus immobile bridgework. This you must admit is a story that thus far has had neither beginning nor ending. Practically every discussion terminates with the resolution: "I move to lay the subject on the table." Hence it is always on the table.

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FOR SOME MONTHS we have had in the Club's Letter Box a communication from Dr. L. Shankroff of Brooklyn, in which he says:

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"I HAVE BEEN FOLLOWING the instructive discussions in your 'Around the Table Talks' for the past year and have profited greatly by the wholesome advice, but have not noticed any reference to the subject of movable-removable bridgework, and the fundamental laws which govern such structures. May I request a discussion in 'Around the Table Talks' upon the following questions, which are very much alive in the profession?

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"FIRST. IS INDIVIDUAL MOVEMENT of the teeth in bridgework essential for the preservation of abutment teeth?

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"SECOND. IS IT TRUE that in fixed bridgework large saddles create a baneful influence upon the mucous membrane? That such saddles produce a stasis about the area and that retrogressive changes ensue?

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"THIRD. DO SUCH RETROGRESSIVE CHANGES in the mucous membrane expose the patient to the absorption of toxins from the fetid matter about such an area, causing a slow poisoning and, consequently, a slow death?

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"FOURTH. IF THE ABOVE STATEMENTS are true, has not the time come for the instruction in fixed bridgework to be abolished from our dental institutions? Hundreds of embryo dentists are turned out every year from our colleges with an elaborate knowledge of how to infect and poison their innocent clientele! Would such action be tolerated by the medical profession?"

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THE ABOVE QUESTIONS were submitted to ten teachers of the subject of bridgework in leading dental schools. Of these, eight have made no reply whatever. Perhaps they have not had the time. Let us hope they may soon have enough leisure to discuss this subject, since it is receiving more and more thought annually, by the rank and file, for which reason the leaders are in duty bound to express themselves, with evidence pro or con. One prominent teacher, I regret to say, declined to discuss the matter in print, though he stated definitely in his private communication that fixed bridgework has a place in dentistry. Now if it be true that fixed bridgework has a place in dentistry, is it not high time that the place of fixed bridgework should be fixed? If fixed bridgework is ever excusable, then the excuse for it should be definitely enunciated. Tell us, O Teachers! the where, when, and how of fixed bridgework, in order that the rank and file may likewise know the nowhere and the nohow, as well as the know how.

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THIS LEAVES US one brave knight who has taken up his pen, which you know is mightier than the sword, and has entered the fray. All honor, and many thanks to Dr. Forest H. Orton, who is willing to express his views.

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"I MUST CONFESS that the phrasing of the questions leaves something to be desired, or so it seems to me, from the standpoint of serving to initiate an impersonal and impartial inquiry. No one can be more insistent than I am that general principles, having scientific validity, are at present an all important desideratum in relation to crown and bridgework; and I believe it is generally recognized by teachers of this subject that we are suffering from a lack of standards and do not yet possess a sufficiently solid and teachable body of doctrine. But it does not follow that the principles which appear to underlie the questions here propounded are adequate to supply the want, or are capable of enduring the searching scrutiny which an all-sided investigation must bring to bear.

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"THE FIRST QUESTION is of such a character that it cannot be answered adequately without considerable elaboration; but one thing

must be clearly recognized at the outset, or we shall never make any real progress in clearing up the problems involved. It is, namely, absolutely essential to understand that the pathosis so frequently seen as the result of fixed bridgework is due to many coöperating causes, and not to the sole operation of any one cause. When many causes contribute to bring about a given effect, it is necessary to examine each cause carefully to determine, if possible, how much it contributes to the sum total of the effect produced. In what follows I shall attempt to note some of these causes.

"A COMMON FAULT in our crown and bridgework is the failure to apply to it the recognized principles governing occlusion. The usual method of obtaining an impression of a so-called 'bite,' of one segment of the arch and the opposing teeth only, is a case in point. Such an impression is mounted on a crown articulator, and the bridge or crown constructed on the model of this segment of the arch, without further verification. Such a model might perhaps constitute a satisfactory guide to the relationships of the teeth involved, while these are at rest, but by no stretch of the imagination can it be said to furnish a satisfactory guide to the relationships of the teeth during the movements of the mandible.

"IF THE CHIEF FUNCTION of the teeth is to masticate food, and if this function is mainly performed during the movements of the mandible, then we have here, in this widespread indifference to the relationships between the occlusal planes of the teeth and the condyloid path, one of the most important of the causes for the pathosis mentioned. And if, in addition to this indifference, we go further and ignore the normal, or most favorable position of the occlusal planes, by adapting the occlusal surface of our bridge to an elongated tooth in the opposite jaw, then we increase considerably the harm caused by such malocclusion. It is my belief that with proper methods of procedure less malocclusion would result, both in the teeth serving as the abutments, and in the opposing teeth as well, if the bridge could be so constructed as to allow of their moving away from the direction of stress.

"THERE IS ALSO ANOTHER PRINCIPLE which is generally neglected. It is forgotten that an unfavorable shape of the teeth themselves may favor the retention of stagnant saliva and sordes, and hence may be a predisposing factor in caries and gingivitis. Every line in the surface anatomy has a meaning; no feature is the result of mere chance. And yet it is a rare thing to see an artificial crown that really reproduces the favorable lines of the natural

tooth; so rare, indeed, that the sight amounts to a privilege and a wonder. This wholly unnecessary indifference to the prophylactic value of favorable conditions, is a factor that must be taken into consideration, before we are prepared to pass judgment on the value of fixed bridgework.

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"NOW, AS TO THE INDIVIDUAL MOVEMENTS of the teeth: If we purpose to adopt natural conditions as our guide, it is important to know just what function is performed by the individual movements of the teeth. We know that there is a considerable difference between them in the matter of anchorage, and, therefore, in their power to resist movement. Those teeth which have to sustain the greatest stress, also, have the most substantial anchorage. Trifurcated and bifurcated roots of the primitive type have less movement than the teeth packed together in a crowded arch where the roots are fused, as seen most often in the funnel-shaped and degenerate third molar. Again, there is a greater movement of the teeth in youth than in old age.

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"'THE THICKNESS OF THE MEMBRANE varies very much in different individuals, and in different teeth of the same individual. It is thickest in the child, and becomes thinner (normally) as age advances. With increasing age cementum is thickened, the walls of the alveolus are strengthened, the thickness of the peridental membrane diminishes and all its fibers are shortened by being included in the cementum on one side and in the bone on the other.' (Black, 'Periosteum and Peridental Membrane.')

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"BECAUSE OF THESE CHANGES the movement of the teeth is greatly diminished. The arrangement of the fibers with respect to the physical function of the membrane seems to be that of maintaining the tooth in its position during the strain imposed by its normal usage. But it is a well-known clinical fact that the adjacent teeth also serve to render one another support, so that when a tooth is lost from the arch, the approximating teeth drop into the space left vacant, from loss of lateral support. Thus they soon acquire an increased range of movement above the normal. Now, in these cases it has been repeatedly demonstrated that the use of fixed bridgework, in order to immobilize these teeth to a certain degree has served to prolong their life and usefulness for many years."

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PERHAPS BROTHER ORTON will permit an interruption here for a brief comment. Let us grant for a moment that, in some instances, fixed bridgework has been placed upon loose, or loosened, teeth

with the result that they have grown tighter. Don't see any difference between a loose and a loosened tooth? Then, perhaps, I should differentiate. If a tooth has been attacked by pyorrhea and, being more or less surrounded by a diseased socket, is readily movable, it is a loose tooth. Being loose, some sort of splint which will hold it rigid while tissue repair is inaugurated, will materially aid in the cure. On the other hand, a tooth which has lost the support of its neighbor because of the extraction of the latter, is subjected to extra strain in mastication and is more and more loosened, by the more or less continuous resorption of its alveolus due to this abnormal stress.

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IT FOLLOWS THEREFORE, or so it seems to me, that in the case of the loose or diseased tooth, the fixed bridge is an advantage only to the extent that it acts as a splint, and only during the normal period of splint usage, which would be until the repair of tissue had been completed. A surgeon may require a plaster splint for fixation of a broken long bone, but while the primary use of the splint would hasten repair of tissue, the continued use of the splint would inevitably result in atrophy.

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IF, THEN, A FIXED BRIDGE, acting as a splint, will hasten the healing about a loose or diseased tooth, could not a properly made removable bridge likewise be made to serve as a splint, by merely not removing it during the process of tissue repair, after which time, the tooth having been appreciably fixed by Nature in its socket to an approximation of normal, would it not be an advantage if the splint-bridge could then serve as a removable denture? Would this not be analogous to the surgeon's removal of his plaster cast from the leg, and recommendation of a crutch to help the lame man to walk? That is to say, to use his leg?

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IN THE CASE OF A LOOSENED tooth, would not a removable bridge give to the loosened tooth that adjacent support for lack of which it is becoming more and more loosened, without adding to its troubles the permanent support of artificial neighbors, as must be the case in fixed bridgework? Pardon these random thoughts, Brother Orton, but if, indeed, there is any place for fixed bridgework, it does not seem to me to be on, or about, loose or loosened teeth. Dr. Orton goes on to say:

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"IN VIEW OF ALL of the foregoing considerations, it seems to me that a sound and sensible answer to the first question will have to be given in the form of a Scotch verdict: 'Not proven.' That is, it has

not yet been shown that individual movement of the teeth is of such essential importance as to indicate the abandonment of fixed bridgework. There are many requirements instrumental to the realization of the most favorable conditions, the absence of any one of which may result in failure. To recognize only one requirement, and that one which has not yet been proven essential, and to stress this problematic requirement to the exclusion of all the rest, seems to me to be neither good science, nor good sense.

"THE SECOND QUESTION deals with the effect of large saddles. I know of only three colleges that still retain this archaic method in their technique. It has been shown that it is extremely difficult for the patient to keep large saddles in fixed bridgework clean, and the banefulness of unhygienic conditions is naturally not a subject for discussion. The second part of this question refers, I assume, to a stoppage of the flow of blood due to a venous congestion, in this case, the result of a persistent pressure on the part of the saddle. Now, if this is what the question means, I cannot understand how there could be persistent pressure under a saddle in a rigid bridge, unless the abutment teeth continued to be intruded.

"THE THIRD QUESTION appears to be an extension of the second. It suggests an inference whose validity depends upon the correctness of the premise on which it is based, involving, namely, the supposed use of large saddles. The answer to this question is the one I have already indicated: We no longer use large saddles.

"THE FOURTH QUESTION is in the same class as the third. Although large saddles are not specifically mentioned, the backward reference, to the second and third questions, implies that the conclusions are based upon the 'baneful influence of fixed bridgework with large saddles.' If it is this type of bridgework that is here in question, the answer has already been given above: 'We no longer use large saddles.'

"BUT IF CASE THE QUESTION is intended to refer to other types of fixed bridgework as well, then it must be noted that the considerations brought out in questions two and three are, for this purpose, extraneous and irrelevant, and we are thrown back upon the matters discussed in question one, for the 'true statements' which are relied upon to support so sweeping a conclusion. It will be understood by the reader who bears in mind my discussion of the first question, that I cannot subscribe to the assertion that fixed bridgework is necessarily unhygienic.

"ON THE CONTRARY, I BELIEVE, that the colleges are inconsistent in not devoting a larger share of their time to training for this work, as compared with other branches of restorative dentistry. I believe this, in view of its wonderful possibilities for restoring an arch mutilated by the loss of one or more teeth, and in view of the large percentage of cases in which this sort of work is undoubtedly indicated. Those branches of dentistry which occupy a large proportionate place in the routine practice of the average dentist are surely the branches in which intensive instruction should be given; yet I know from personal investigation that this subject is often treated as if it were only of secondary importance to the general practitioner. It is handled as though it were a specialty, so to speak, like orthodontia, practiced only occasionally, in those localities which are too small to have a specialist.

"IT IS INTERESTING TO OBSERVE that the four questions presented for discussion culminate in implying a sweeping condemnation of the dental colleges, couched in the most rhetorical terms. The colleges have their faults and I would be the last man in the world to plead for a covering up of their shortcomings. But I would like to suggest in my turn a question upon which it might be wholesome for us all to meditate. The question is this: 'Should the standards for the dental profession be determined by the dental colleges in the sense that they are responsible for taking the initiative in this matter? Or should the responsibility of the colleges be confined to the teaching and the registering of the best approved practice in the profession at large?'

"IT IS NOT NECESSARY to answer this question by a categorical 'Yes' or 'No.' But if we think before we answer, it may occur to us that teachers are not supermen, but, on the contrary, are made of much the same flesh and blood as the average practitioner. We are subject to the same impulses and are swayed by the same powers of suggestion, as lead other dentists astray. Many of us are innocent of pedagogical training. We are not teachers by vocation, but by avocation. Most of those I have met are sincere and earnest dentists who are sacrificing material advantages for the sake of the opportunity to teach. Now, then, are these men solely responsible for the setting up of forms and standards? Or, have they a right to be guided in their teaching by the already recognized standards of the dental profession outside the class-room?"

AT THIS JUNCTURE, as they say in the lodges, "there is an alarm at the door." Post-haste I go to the door, and lo! the postman has

❖ come with a letter; a letter from Dr. Cummer. Dr. W. E. Cummer, ❖ of Toronto, the well-known teacher of this subject. Thus we have ❖ another contribution from a teacher, and this is both welcome and ❖ opportune. Dr. Cummer expresses his views as follows: ❖ ❖

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"THE FIRST QUESTION asks whether individual tooth movement in ❖ bridgework is essential for the preservation of the abutments. From ❖ a physiological standpoint, in many cases it is essential and in all ❖ cases highly desirable. There is one exception; in lower anterior ❖ teeth, loosened through peridental disease. By splint work, or by ❖ cleansible fixed bridgework these may often be cured and reduced ❖ to an approximation of the normal natural movement. This tem- ❖ porarily enables the patient to wear a partial lower denture, thus ❖ avoiding the full lower denture and increasing the masticatory ❖ efficiency by providing bone support in combination with gum ❖ support for the stress of mastication, which is preferable to gum ❖ support alone, as with full lower dentures. ❖ ❖

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"FROM A MECHANICAL STANDPOINT a bridge, fixed yet mov- ❖ able, having a flexible joint admitting individual movement, is highly ❖ desirable because, in addition to the physiological reasons announced ❖ by Dr. Chayes, this involves less strain on the abutment connection ❖ and consequently permits an abutment connection requiring less ❖ tooth cutting, and therefore less menace to the tooth pulp, than ❖ would be possible with a rigid type of attachment. ❖ ❖

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"THE SECOND QUESTION deals with the matter of large saddles and ❖ their possible baneful influence. I would submit that food and ❖ saliva under conditions favoring bacterial propagation, held in close ❖ contact with the mucosa, must bring about a condition which healthy ❖ issue would certainly resent. ❖ ❖

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"THE THIRD INQUIRY asks whether retrogressive changes in the ❖ mucous membrane may not expose the patient to the absorption of ❖ toxins from the fetid matter about such an area, etc. If this pre- ❖ supposes the condition described in the second question, that is to ❖ say a large fixed saddle, I should answer 'Yes.' ❖ ❖

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"QUESTION FOUR sets up a dogma as regards college teaching with ❖ which the writer is not prepared altogether to agree. ❖ ❖

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"IN REGARD to individual tooth movement, let me say a word. It would ❖ appear that the normal movement of the full complement of teeth ❖ is, generally speaking, bucco- or labio-lingual. Mesial and distal

movements are prevented, or opposed by the adjacent teeth. A short fixed three-tooth bridge, supplying one missing tooth, as, for example, using second bicuspid and second molar to support an artificial first molar, is a construction with abutments and dummy in a straight line. Such a structure is flexible, allowing approximately, buccal and lingual motion, thus simulating the normal tooth movement, and we have the roots of two teeth enduring the stress of only three teeth.

"FOR SPACES REQUIRING more than one tooth, the writer would submit that partial dentures, or removable bridge construction is to be preferred. Partial dentures in such cases should have occlusal rests, or other means of dividing the stress between the gum and the supporting natural teeth.

"REMOVABLE BRIDGEWORK should be the preference where the teeth at each end of the space already have cavities as a result of caries, thus affording space for bridge attachments fitting into recesses in inlays, with a minimum necessity for cutting tooth tissue.

"WHERE THE TEETH AT THE ENDS of the spaces are sound, the writer would advocate a partial denture with large saddle, and an attachment offering the minimum of danger to a vital tooth.

"FINALLY THE WRITER would submit that large stationary saddles attached to fixed bridges have no proper place in dentistry, and that in fixed bridgework all parts as far as possible should avoid contact with the mucosa." 1918.

COMMENT. At the time when the above Table Talk was published the questions asked by Dr. Shrankoff were very much alive, and they have not really died, even at the present date. Indeed, we still have many who claim that there is no proper place for fixed bridgework, others who deny this, while admitting that fixed bridgework has limited uses; but none who has outlined the limitations of this type of work, in language acceptable to all. 1928.

XXX.

THE TABLE TALK published in the March issue, has brought in two communications, one from Dr. I. W. Frahm, formerly of Denver, Colo., but at present teaching in the College of Dentistry, University of Southern California; the other being from our good friend Dr. Orton. Let us read Dr. Frahm's letter first. He writes as follows:

"I HAVE ENJOYED the March Table Talk very much, especially so for two reasons. First; it is generally always the first part of each issue of 'Dental Items of Interest' that I read. Second; because I am very vitally interested in bridgework of all kinds, under all conditions, in all kinds of environments.

"I HAVE BEEN A TEACHER of crown and bridgework and prosthodontia for nearly seven years; have tried to keep abreast with thought along that line. It has not been an easy task to teach crown and bridgework these days, owing to the fact that there are no standard methods, nor ideas that can be recognized and considered fundamental enough for supporting any superstructure.

"EVERY MAN HAS IDEAS of his own, many of them valuable, and some of inestimable worth. These ideas would be of great use to the teacher if they were fundamental in their character and would not be changed before the ink, used in explaining the technique, had time to dry and get black.

"THERE MUST BE FORMULATED certain standards for bridgework that can be recognized as fundamental and also constructive. These standards must bear a definite relation to the requirements of each of the two classes of bridgework.

"AS A TEACHER OF THIS BRANCH of dentistry, I have availed myself of the opportunity to clear the mind of the student in regard to old and established notions of fixed bridgework, and have tried to set forth the limitation of this class. Also to set up certain guides

for him in his selection of the type to be used for the cases presented. It is his duty to make study casts of the case, and fill out a diagnosis and treatment sheet. In this way we have tried to get away from 'snapshot diagnosis' and the application of an appliance that is not based on a careful consideration of all the requirements of the case, and the limitations of certain procedures usually followed when a case is not carefully and scientifically handled.

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"IT IS NOT UNUSUAL for a dentist to give too much consideration to the ideas and whims of the patient, without due regard for what he knows should be done, it being easier to just drift along the accustomed groove, giving the patient what he wants, regardless of the real needs.

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"THERE ARE CONDITIONS and requirements where a fixed bridge is by far the best remedy; likewise, conditions where it is unquestionably contraindicated. This may also be said of removable and semi-removable bridgework. Also there are conditions where a partial denture is preëminently to be chosen.

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"A GREAT DEAL may be said on the theme of 'Whether the dog shall wag the tail, or the tail the dog.' That is, 'Shall we practice dentistry as it is taught, or teach it as it is practiced?' This raises the question of which section of the profession shall constitute the element that is to direct the effort. Shall it be the men who are always at the head of the procession and virtually doing the teaching, or shall it be the men who are the rear guard largely by choice and general inclination? They refuse to read the journals or to attend meetings, and contribute nothing, unless their brake-like action is of value. Personally, I think that those men who are working so unceasingly and always considering the welfare of the whole should continue to 'Wag the tail,' or direct the thought of the college and profession.

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"BUT IT IS ALWAYS WELL to remember that the work of the college teacher is not the making of specialists out of the students. His work can scarcely go beyond the laying of the foundations upon which the student is to rear the superstructure.

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"I HOPE THAT THE discussion of the two great classes of bridgework has only just begun and may continue for months. By such means great good must be the outcome."

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DR. ORTON'S LETTER reads as follows: "Permit me to correct an apparent misapprehension of a sentence contained in my letter published in the March number. Judging from your comment, I must have failed to express my meaning clearly. At the same time, the possibility of such a misunderstanding points to the need of an accepted classification of unfavorable conditions, by a reference to which ambiguities of this kind might be largely obviated.

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"THE MISUNDERSTANDING in question relates to my use of the fact that the teeth serve to render each other mutual support, so that when a tooth is lost from the arch the approximating teeth tend to work their way into the space left vacant, thus acquiring an abnormal range of movement. 'Now, in these cases,' I remarked, 'it has been repeatedly demonstrated that the use of fixed bridgework in order to immobilize these teeth to a certain extent, has served to prolong their life and usefulness for many years.'

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"IN THIS PASSAGE I had no reference to loose or loosened teeth, as the editorial comment seems to infer, but merely to teeth having lost their lateral support on one side. Let us assume for example the simple case of the loss of the first lower molar. There invariably occurs as a consequence, a gradual mesial-lingual tipping of the second and third molars, and a buccal tipping of the opposing teeth. The change is gradual, extending over a period of years. It may be very much slower than the changes forced by orthodontic appliances. In the early stages such a condition presents no indications of pathosis, no signs of pyorrhea; and the teeth are not loose, as that term is ordinarily understood. The teeth simply do not have the same support that they formerly had and still need.

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"ONE OF THE SIMPLEST METHODS at our command for the correction of this condition, as well as for the restoration of normal occlusion, a method which prevents further changes in the arches, in my opinion, is the use of a properly constructed fixed bridge. The comparison with a surgeon's splint is wholly inapplicable, and the two cases are not at all parallel. A surgeon's splint is used to immobilize a tissue temporarily, so as to make more favorable the conditions of repair; a fixed bridge is intended to act as a substitute for lost tissue, and to restore lost function. A properly constructed bridge would not absolutely immobilize the teeth, though it would prevent the teeth used as piers from moving, except in unison. My experience is that the majority of fixed bridges have altogether too much, instead of too little, movement. Fixed bridgework as such

❖ should not be made responsible for what is merely an ordinary fail-
❖ ure to pay attention to certain essential requirements of good den-
❖ tistry. ❖ ❖

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"I WOULD NOT HAVE it understood that I am advocating fixed
❖ bridgework in general, as opposed to removable bridgework in gen-
❖ eral. I am, on the contrary, thoroughly distrustful of all panaceas,
❖ by whatever name they are called. I am convinced that fixed
❖ bridgework has a limited range of application. Merely to illustrate
❖ my position, I will say that I am among the pioneers in the construc-
❖ tion of removable bridgework. I have one patient for whom I con-
❖ structed a removable bridge eighteen years ago, since several times
❖ repaired, and still doing good service. I also have several patients
❖ for whom I constructed fixed bridgework in 1898, and two in 1899.
❖ Within the last two years I have inspected all these cases, and have
❖ found the abutment teeth still firm—I mean that they are as firm
❖ as the corresponding teeth on the opposite side of the arch, which
❖ have not been immobilized. Considering that I was at that time
❖ quite ignorant of essential requirements, and that my experience was
❖ limited, the fact that good results were obtained seems to me
❖ sufficient justification of my insistence that further proof ought to
❖ be presented before the profession can justly be called upon to
❖ abandon this apparently valuable method. Nor is my experience
❖ in this respect exceptional. It is difficult not to feel that the factor
❖ of mobility is being over-emphasized, and the whole problem too
❖ much simplified. ❖ ❖

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"PERMIT ME ONCE MORE to emphasize the changes that take place
❖ when a tooth is lost from the arch. There are changes in the oppos-
❖ ing teeth, and in the occlusal plane, bringing it out of harmony with
❖ the planes of the remaining natural teeth; changes which are so
❖ slight as to be frequently overlooked when examining the mouth
❖ itself, and which should, therefore, receive special study when exam-
❖ ining our models. When these changes are ignored, and I mean to
❖ include even the slightest distortion of the occlusal plane, as well
❖ as the dropping or elongation of an opposing tooth; and when the
❖ bridge is simply made so as to touch when the teeth are in con-
❖ tact, then it is inevitable that the occlusion should prove to be
❖ faulty. In that case, less harm will be caused to the abutment teeth,
❖ as well as to the opposing teeth, if both the abutments and the
❖ dummies be allowed individual movement—I had almost said, the
❖ more movement the better." 1918.

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COMMENT. This and the previous Table Talk should be read studiously by all recent graduates, because they contain sane discussion of a controversy that split our profession asunder during that period. I would particularly call attention to a word used by Dr. Cummer, where he speaks of "cleansible" fixed bridgework. The older phrase "self-cleansing bridgework" is certainly ridiculous, since no bridgework cleanses itself, not even removable bridgework. But Dr. Cummer's word "cleansible," is not limited to that type of bridgework commonly called "self-cleansing," which generally means pontics free of contact with the gum, but he erects the dogma that all fixed bridgework, to be successful, must be cleansible, and modern fixed bridgework is practically always constructed to meet this requirement. This removes, at least a part of the stigma. 1928.

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XXXI.

RECENTLY TWO OTHERS AND I were sitting around a table, and as there was neither food nor drink on the table, the opportunity for uninterrupted conversation tempted us to discuss a somewhat new subject, to wit, "The Technique of Pulp Removal."

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BEFORE PROCEEDING perhaps I should explain the seemingly strange circumstance that three dentists should be at a table without viands. Really, couldn't be otherwise as the table was situated in the private sanctum of Brother Harvey Burkhart, in the Rochester Dental Infirmary. The absence of the Hoover specialties must not be taken as any reflection on Brother Harvey's hospitality, because when it comes to hospitality that man stands "Big A, Big 1." He is the sort of man who divides his last apple between two friends and then watches them eat, wondering perhaps if one of them might hand him back a bite of the core. No! The lack of eatables on that table was not traceable to inhospitality, but feasting in the Chief Executive's office in a dental infirmary simply is not done; or at any rate it is not done in the Rochester Infirmary.

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HOPING THAT I HAVE MADE this matter clear, we may return to our new subject, the removal of living pulps. Dr. Tompkins, our Utica Brother, started something like this:

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"OF COURSE, I AM OPPOSED to the use of arsenic for devitalizing pulps. I understand thoroughly all the dangers, and I prefer to use pressure anesthesia. There is no doubt in the world that arsenic should be avoided. But then on the other hand, pressure anesthesia is not invariably effective. Some folks seem to resist all efforts at anesthetising the pulp. In such cases, I am sometimes simply driven to the use of arsenic. Then, of course, I feel that I must safeguard my patient to the utmost, and I just want to describe a little technique that has proven very satisfactory to me.

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"ASIDE FROM POSSIBLE irritation at the apex, which can be minimized by using minute doses, I think the great danger to be avoided is a leakage of the arsenic on to the gum, with consequent destruction

of both gum and alveolar process. In such cases, that is to say, when I am simply driven to resort to arsenic, I use the tiniest bit of arsenic in powder form, and mix this with the powder of my oxyphosphate. Then with a drop of the liquid I make a little paste and place just the tiniest bit of this mix immediately over the point of exposure. This can be kept clear of the gingival cavity margins, and will set hard in a few moments, when your arsenical application will be firmly attached to the dentin and the cavity may then be sealed without dislodgement, and consequent escape against the gum margin."

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ASKED WHETHER the arsenic combined in this manner with oxyphosphate cement would still prove active, Brother Tompkins reported that he had found it so, and thought moreover that the slower liberation of the arsenic when applied in this manner results in a more painless devitalization of the pulp and less danger of apical irritation.

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THE OTHER MEMBER of our coterie, (nice word "coterie"; glad I thought of it. Would rather be in a "coterie" any day, than in a crowd. Crowds are so "bourgeoise." Another nice word that!) Anyway, the other man present was Dr. A. P. Burkhart, the Secretary of the New York State Dental Society, not the aforementioned Harvey. "Speaking of pain in connection with the use of arsenic," said Brother A. P. Burkhart, "like Tompkins, I must admit that I am opposed to arsenic, and I think that not once in a thousand times is it necessary to use arsenic. Still, when one does use it, naturally he would prefer that his patient should have no pain. I have had great satisfaction with the following method. With a tiny camel's hair brush dust a bit of arsenic directly over the exposure; on it, if possible to procure an actual exposure. Then over this, place a billet of neurocain, such as comes for pressure anesthesia. Then seal the cavity carefully. I have never had a patient report pain."

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THE ABOVE METHODS are described from memory, and it is to be hoped that I have not misrepresented either of my good friends. If I have I would be glad to have their methods properly described for future communication to the Club.

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IN REGARD TO THE DOSE of arsenic to be used for devitalization it is well to remember the formula given to us many years ago by Foster Flagg. He said: "Take the smallest possible quantity of arsenic, and then use one-tenth of that." Read that formula over

several times, Brothers, and by degrees the great moral contained therein will filter through your tired brains. I say tired brains, because at this season of the year we are all of us a bit tired, and wondering if really we ought not to try "Hood's Sarsaparilla."

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THE CARE WITH WHICH Brothers Tompkins and Burkhart caution us against using arsenic, and then tell us the best method of using it if we do use it, reminds me of a good moral story that I just must tell the Club because the moral is so good; and so applicable.

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A CERTAIN SCHOOLMASTER in a small country town thus addressed his class on one occasion: "Boys," he said, "the County Fair opens here next week, and I want you boys, all of you, to promise not to go to the County Fair. Now I know you boys so well, that I know that in spite of my advice, some of you will go to the Fair, so perhaps I should tell you why I advise you not to go.

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"THERE IS NO REAL HARM in the County Fair itself. The trouble is they are going to have horse-trotting, and it is very bad for boys to go to a horse trot. So if any of you disobey me and go to the Fair, just keep away from the race-track.

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"UNFORTUNATELY I FEEL it in my bones that some of you will not only go to the Fair but also to the race-track, so let me explain further. I do not think there is any harm in watching a lot of thoroughbred horses race. Fact is, it is rather an exhilarating sight. But the trouble is they have betting on those trots, and it would be wicked for boys to bet.

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"NOW OF COURSE, it is wicked for boys to bet, especially if they lose. So I just want to tell you one thing more; I'd hate to see any of you boys at that Fair, in that race-track and betting on the races; but if you do all those things, I don't want you to lose any money.

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"SO THEN, BOYS, if in spite of my advice you go to the Fair, and go to the races, and bet on the horses, put your money on Confucius. I have a cast iron tip that he could trot circles around Maud S. at her best."

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PERSONALLY, I HAVE BEEN able to exclude arsenic from my office ever since pressure anesthesia was first introduced, and whilst the two methods above described seem to me to have merit, and are published for the members of the Club who feel that once in a

thousand times, more or less, they must use arsenic, nevertheless, it seems to me that exactly in those instances where pressure anesthesia proves ineffectual, would arsenic prove most hazardous.

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PRESSURE ANESTHESIA fails most frequently in cases where the circulation in the pulp has been impaired by deposits of secondary dentin, either as nodules, or more or less complete calcification of the pulp itself. Occasionally in such cases the attempt at pressure anesthesia may prove successful at a second sitting, where it fails at the first, possibly due to a lowering of the congestion of the capillaries, which still remain in the pulp. Where renewed efforts fail, it will often be due to the fact that the calcifications are a barrier to the action of the anesthetic, and in such cases the same barriers would act against arsenic, causing intense agony, and even the combination of neurocain with the arsenic, as suggested by Brother Burkhart, would not, in my opinion, alleviate the pain.

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IN THESE CASES, frequently the barrier of calcification lessens as we pass beyond the actual pulp chamber and down into the canals. Consequently if we could but remove the calcified coronal portions of the pulp we could subsequently control the canal contents with pressure anesthesia.

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CURIOUSLY ENOUGH, it often occurs that these calcified pulps are intensely sensitive, responding painfully to the slightest touch so that use of the engine bur becomes impossible without an anesthetic of some sort. If necessary, I would use full anesthesia with nitrous oxid and oxygen, but I have not been compelled to resort to this extreme measure in over ten years.

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I HAVE, HOWEVER, been satisfactorily successful with chlorid of ethyl. If incorrectly administered this would be very painful, and in many instances some pain is experienced despite all precautions. Usually, however, this is of brief duration. The least painful technique is to place in the cavity first, several successive applications of cotton, saturated with ether. When the tooth endures the application of ether without pain, the last piece of cotton is left in the cavity, and the stream of chlorid of ethyl is discharged directly on the cotton for a few moments. Then the cotton is removed and the chlorid of ethyl spray is directed into the cavity.

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DO NOT EXPECT the best result with a brief application. Use the spray at least until the cavity is apparently fully covered with snow-like

❖ crystals, and then keep it up a bit longer. Usually the calcific material may thus be removed until the uncalcified pulp tissue is exposed. A sedative dressing may then be applied which will keep the pulp quiescent until a next sitting, when usually pressure anesthesia will be successful. ❖ ❖

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THE ABOVE TECHNIQUE may likewise be used to fully expose pulps where pulp removal becomes requisite, but where a stratum of dentin still remains over the pulp. After freezing with the chlorid of ethyl, large sharp burs should be used with light touches until a drop of blood escapes from the pulp. The large bur is requisite to prevent plunging into the pulp, as would occur with a small bur. Opening into a pulp with a spear-pointed drill is so brutal that it may well be classed as malpractice. ❖ ❖

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IN AN EXCELLENT PAPER by Dr. Coolidge, the suggestion is made that arsenic may occasionally be used, not for devitalization but as an obtundant, so that the pulp may be painlessly exposed and pressure anesthesia then resorted to. It would seem a method of doubtful efficiency. Much would depend upon the proximity of the pulp, and also upon the penetrability of the dentin, which varies considerably in different individuals. If the arsenic should have any effect upon the pulp itself, it has been my experience, and I speak from experience, that subsequent efforts at pressure anesthesia would be futile, even though the pulp might still be so much "alive" that removal would be quite painful. 1918.

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XXXII.

THERE IS A LETTER in the Club's Question Box that should have been read and discussed long ago. It is from Dr. P. D. Brooker, of Columbia, S. C., and reads as follows:

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"WOULD IT BE PRACTICABLE to give us in some early issue some advice upon the subject of pulp capping? It appears to me that this is quite an important subject in this—I might say—crisis in the care of root canals. There are a great many pulps that it appears ought to be saved by a more scientific treatment, but in which I have been almost universally unsuccessful. I have no doubt that many others are having the same experience and would welcome suggestions for the better care of those cases in which the pulp must be barely uncovered and which has apparently not already become infected."

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THERE IS NO DOUBT, as Brother Brooker says, that it would be more desirable to save pulps alive by some system of capping were it only feasible. It seems probable that under selected conditions and in carefully chosen cases, such a course might be perfectly permissible. The danger of advocating pulp capping lies in the fact that many practitioners would use the method too indiscriminately, as promising a short road to the avoidance of root canal treatment.

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DR. BROOKER ALLUDES to those cases "in which the pulp must be barely uncovered and which have apparently not already become infected." The difficulty would be to find a means of knowing definitely whether or not infection had occurred. Then again, the pulp is prone to other diseases than those that result from infection. These have been pointed out by Broomel and Vida Latham and the subject is too large to be discussed here. In passing, however, it may be said that in proportion as the pulp is old, it is more apt to be diseased. To cite an extreme case, a pulp in the first permanent molar of a child, aged eight, is not likely to be suffering from calcific degeneration.

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THIS BRINGS US to the alternative statement that in proportion as a pulp is young, does it become necessary, if at all possible, to pre-

❖ serve it alive. And fortunately, it may be added that just in proportion to the youth of the patient is an attempt at pulp capping excusable. ❖ ❖

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LET ME GIVE THE HISTORY of two cases. The first was a lower first molar in the mouth of a boy aged ten. In removing the decay, a horn of the pulp was uncovered and just the minutest flow of blood resulted. A palpable exposure. Not wishing to remove a pulp at that early age, it was capped by a method presently to be described, and the cavity filled with base-plate gutta-percha. ❖ ❖

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SIXTEEN MONTHS LATER THE PATIENT presented with the gutta-percha badly worn away, allowing food to pack into the interproximal space. The dam was applied, gutta-percha and capping removed and the pulp found to be alive, as was attested by delicately touching it through the minute point of exposure. Some authorities have claimed that such openings to the pulp may be closed and the pulp again covered over with new dentin, but I have never seen this. ❖

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THE PULP HAVING RETAINED its vitality for so many months under this treatment, it was deemed safe to cap it again in the same manner, and this time it was covered with a gold inlay. This tooth has been examined during the past winter, one year since the second treatment, and two and one-half years after the primary exposure. Galvanic and other tests show the pulp to be still alive. ❖ ❖

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BASED LARGELY ON THIS experience, another child has been similarly treated during the past season and similar results are confidently anticipated. This last case is unparalleled in my experience. The patient is a girl fourteen years of age. Very large for her age, and unduly developed, yet with rapid and progressive caries present. Examination disclosed large cavities in all eight molars. Attempts at preparation showed that in every case the pulp would have been exposed if all decay had been removed. What a disaster for the patient, and what a labor for the operator to attempt pulp removal in eight young molars in the mouth of a sensitive child, especially with the probability that all, or nearly all, apical foramina would be found incompletely closed! ❖ ❖

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SITTINGS AT FIRST were made quite frequent and these molars were treated as rapidly as possible. In each, a capping was placed and covered with base-plate gutta-percha. The teeth were then allowed two months to rest, during which time the other cavities in the

mouth, numerous, but not so closely approaching the pulps, were permanently filled.

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DURING THIS INTERVAL all the molar teeth had remained entirely comfortable, and all were positive to the galvanic tests for vitality. Each then was in turn permanently filled with a gold inlay.

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THE METHOD OF CAPPING was based upon a statement made long ago by Dr. Miller, which, as I recall it, was to the effect that in decalcified dentin, the leather-like mass could be disinfected and at the same time hardened with oil of cloves. If this be true, what better cap can one have than this leathery mass sterilized and hardened?

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AS THIS LEATHERY MASS of dentin is in juxtaposition with the pulp (as it must be, else its removal would not cause an exposure), it would be manifestly advantageous to leave it in place, since its removal must injure the odontoblastic layer.

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ADOPTING THIS SUGGESTION by Prof. Miller, the treatment in such cases is as follows: The carious dentin is removed with spoon excavators, great care being observed not to remove that which is just over the pulp. Cotton, saturated with oil of cloves, is then sealed in with one of the temporary cements. Two or three days later the temporary dressing is removed and the cap placed.

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THE ACTUAL PULP CAPPING is done as follows: A paste is made of oil of cloves and the powder of oxyphosphate cement. A metallic cap is then made, preferably of irridio-platinum. This cap is made hemispherical and concaved. It may be done with suitable contouring pliers, or by malleting with a round end burnisher into a block of lead. The concaved cap is fitted to the bottom of the cavity and of such size and shape that its edges rest on sound dentin, thus bridging over and preventing future pressure upon the underlying pulp.

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THE CONCAVED HOLLOW in the metallic cap is filled with the oil of cloves paste and placed over the point of suspected exposure (or, as in the first case cited, over the actual exposure) and is then protected with a layer of oxyphosphate mixed to a creamy consistency and flowed over the capping.

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THIS PROVIDES the pulp with a metallic, bridge-like protection and the metallic cap likewise prevents the admixing of the oil of cloves

paste with the superimposed oxyphosphate. It is deemed essential to thus maintain the hardening and sterilizing effect of the oil of cloves against the decalcified dentin left in place.

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IT SHOULD NOT BE PRESUMED that this method will be universally successful. Failure should be expected and provided for in every instance. It is therefore preferable to place temporary fillings over such caps for two or more months, before resorting to gold or amalgam.

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OF ALL FILLINGS the cast gold inlay is the most desirable in these cases, since it can be so constructed as to afford a ready means of access to the canal in case of death of the pulp, the possibility of which should never be overlooked.

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THE WAX PATTERN of the inlay having been made, a box should be cut in the underside immediately over the region of the pulp. In constructing this hollow, the pattern should be examined by transmitted light and should be carved until light readily passes through the wax. This will give an occlusal surface of wax so thin, that it can be readily pierced with a drill in case it should become necessary to enter for the removal of a dead pulp. To facilitate this, the box should be filled prior to cementation with a soft temporary stopping, so that after the drill should have pierced the gold, further approach to the pulp chamber will be easy, as it would not be, were cement permitted to enter this cavity. 1918.

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COMMENT. Since the above was published, quite a considerable quantity of water has flowed over the dams, and the research men traveling down the stream of investigation have brought us much knowledge in relation to the behavior of exposed pulps.

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FIRST A WORD OR TWO about tests for vitality. In one paragraph in the above talk I speak of testing a pulp that had been capped and the cavity filled with gutta-percha. Later the gutta-percha was removed and the pulp found to be alive, which was learned "by delicately touching it through the minute point of exposure." This of course was reliable. But again I refer to electric tests, and say "Galvanic, and other tests show the pulp to be still alive." And speaking of other capped pulps I state that they were "positive to the galvanic tests for vitality."

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THIS IS A COMMON ERROR, still very prevalent among the profession. Response to a galvanic test, or to applications of extreme heat or cold, does not really prove that a pulp is alive, although nearly always it would be. But if we are to be scientifically accurate in making a diagnosis, we should remember that it is the nerve in the pulp that reacts to these tests, and not the actual pulp tissue. It is the nerve then, and not the pulp that is alive when we obtain a positive response in pain. Now then, a nerve may be alive, very much alive, and yet may be surrounded by diseased, necrotic, or dead tissue. In fact it is in connection with morbid tissue that nerves are most responsive. A test therefore with the galvanic current, or with applications of cold or heat, should be properly evaluated and accounted as only one of several tests needed to determine the life of a pulp.

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SINCE 1918, Evangeline Jordon has published her classical text-book, "Operative Dentistry for Children," and in this she states that pulps may be amputated and capped, and may still retain vitality. In proof of this she presented a case history from the practice of Dr. Beverly McCullom, in which instance the pulps were removed from the pulp chambers of two lower molars, and the stumps left in the canals were capped with appropriate remedies. At the time of pulp amputation the foramina of these young teeth were still large and the root ends not yet completed. Radiographs were taken periodically during five years, and it was finally found that the root ends were fully formed.

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THIS FACT MAY BE ACCEPTED as proof that the pulps remained alive. Just what occurred at the amputated surfaces has not yet been fully demonstrated, and it is of considerable importance.

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IN ANOTHER PART of the Talk which we are discussing I say: "As this leathery mass is in juxtaposition with the pulp,—it would be manifestly advantageous to leave it in place, since its removal must injure the odontoblastic layer."

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AT THAT TIME it was my opinion that only the odontoblasts could build dentin. Whether this be true or not I do not think has yet been proven. But we have had abundance of evidence, from Clyde Davis and others, that a pulp may be resected and an antiseptic paste laid against it, and the pulp may remain alive. Just what occurs at the cut surface, no one has told us. Davis claims that by leaving a remnant of pulp tissue in the apical region, the foramen may, and probably will be closed by the deposition of "osteoid tissue."

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BUT IN ALL OF his sections in support of his contention, Davis shows "osteoid tissue" coming in from the foramen, and being deposited thence upward into the canal. I do not recall any illustrations showing osteoid, or any other hard tissue covering over the amputated surface of the pulp.

DURING RECENT YEARS also it has been demonstrated that the broken or cut surface of a living pulp may be covered over by a deposit of cementum, or similar tissue, in cases of fractured teeth. Thomas[1] demonstrated this in root ends left in sockets after fracture during extraction. Scheier[2] and also Cahn,[3] in sections made for me of fractured teeth showed cementum building into the crevice of the fracture, and narrowing the root canal, especially in the coronal fragment thus forming what might be called a "pseudo foramen." But in all these records the "osteoid" tissue was an ingrowth from the cementum. See also case reported by Dr. Percy Howe.[4]

WE ARE STILL IN DOUBT as to what occurs along the cut surface of an amputated pulp, or a pulp accidentally exposed. The following case history will demonstrate the importance of obtaining definite information along these lines.

THE PATIENT was a boy of ten. He had received a blow from a stone thrown by a playmate. The stone struck the upper left central incisor, completely breaking out a V-shaped fragment from the center of the incisal edge half way to the mesial approximal surface. In addition, a fragment was shattered loose along the approximal surface, the fragment being held in place only by its attachment to the gum tissue.

FORTUNATELY THE BOY was brought to me within a few hours of the accident. Examination showed the further fact that the pulp had become exposed and could and had bled, the exposure however being quite small.

A STUDY OF THE case indicated that if at all possible the pulp should be kept alive. Radiographic examination demonstrated that the foramina of both central incisors were still quite large and the root ends not fully developed.

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[1]The Dental Cosmos, April, 1922.
[2]Dental Items of Interest, February, 1926, p. 81-92.
[3]Dental Items of Interest, October, 1926, p. 717-736.
[4]Dental Items of Interest, February, 1927, p. 80-82.

TO CROWN the injured tooth in the ordinary fashion would mean pulp removal, the filling of a root with a wide open foramen, the cutting off of the natural crown, and the construction of some type of crown under the difficulty presented by the fracture of the approximal surface. An attempt to preserve the pulp was decided upon.

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THE DAM was applied, all surfaces, including the broken surface of the pulp, were cleansed; the fractured-off fragment was bound into proper apposition with orthodontic silk; the pulp was capped, and the space, due to the loss of the V-shaped fragment, was filled with silicate cement.

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THE PATIENT was dismissed for twenty-four hours, and at the next sitting, the silk ligature was removed, and a fairly wide, tight fitting platinum band was made, and cemented to place.

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THE PATIENT WAS REQUIRED to report weekly during the first month, and once a month since that time. At his last visit, six months after capping the pulp and banding the fragment into place, examination showed that the pulp was still alive. This was proven by the fact that radiographs taken at two different angles, show that the foramen of the injured tooth has closed to the same extent as has that of the adjacent incisor. This is seen by comparison with radiographs taken at the first visit.

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IT IS EVIDENT therefore that this pulp can be kept alive until the root end becomes fully developed. This in itself will be well worth while, as the closure of the foramen will greatly facilitate crowning the tooth, in case pulp removal should become necessary.

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BUT THE QUESTION of greatest interest centers around the break in the tooth, and the exposed surface of the pulp. First, will secondary dentin be formed and cover over the broken surface of the pulp? If true secondary dentin be formed, will that indicate that dentin may be deposited by the odontoblasts adjacent to the broken surface of the pulp, thus building laterally so to speak, whereas we have been led to believe that dentin is deposited through the dentinal ends of the odontoblasts. Secondly, may it be possible that the fracture of the pulp will induce the formation of a pulp stone and that later calcific degeneration at this point may lay down calcific material sufficient to close over and cover in the pulp? Or may we hope in time for sufficient deposition of hard tissue, of any sort, so that later in life a porcelain jacket crown may be placed over

❖ a living pulp? Finally, is there any posibility that the approximal
❖ fragment may become reunited to the main body of the root? ❖ ❖

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AT THE PRESENT TIME the radiographs cannot give us any informa-
❖ tion beyond the fact that apical development is going on. The
❖ region where the pulp was capped cannot be seen because the plati-
❖ num band stops the passage of the ray. And it seems of more im-
❖ portance to leave the band in position, thus protecting the tooth, than
❖ to remove it, merely to obtain a radiograph that might, or might not,
❖ satisfy our curiosity as to what changes, if any, are in progress. ❖

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THE CASE is reported here because it appears to be entirely unique and
❖ because the future history of it may bring us some valuable in-
❖ formation. 1928.

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XXXIII.

ONCE UPON A TIME a dentist was just a dentist. Nowadays he is most likely some sort of a "dontist." Orthodontist, Prosthodontist, Periodontist, Exodontist, Pathodontist, Radiodontist, and a few others that I will not name for fear they may be adopted seriously.

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BETWEEN DENTIST AND DONTIST, however, the public is not as yet quite able to discriminate, in evidence of which assertion listen to a conversation recently overheard in a subway train. First Mother: "I hear you have been taking your daughter to the dentist lately?" Second Mother: "Well, not exactly. He is not a regular dentist; he is an 'ortho dentist.'"

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AND "IF WE DON'T WATCH OUT," that random remark may come true, and the orthodontist of the future may not be a "regular dentist," the same being true of the other "dontists."

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IT MAY BE WELL to remember therefore that though a dentist may not be a "dontist," a "dontist" surely should be a dentist.

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THE GREAT WAR PROVED that though there be many many countries, they are all parts of one World and both dependent and interdependent. The recent labor strike in Seattle enabled a New York dentist to earn a nice fee. The patient had business in Alaska, and could attend to preliminaries in Seattle better than in New York. Hence he asked to be referred to a Seattle dentist. The letter of introduction was scarcely dry when news of the strike came, and the New York man had his dentistry done in New York. Yet that result was of course not included within the philosophy of the strike leaders.

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THE MORAL OF WHICH is that all the "dontists" should not only be dentists but should never forget their interdependence. To accentuate this thought a meeting of the Club was held recently at which one respesentative of each style of "dontist" was invited to be present.

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AFTER PARTAKING OF A LIGHT MEAL, consisting of Lynhaven oysters, bisque of crab, terrapin, frogs' legs a la poulette, roast pheasant, endive and beet salad, bombe glace a la Pershing (red, white and blue with small American flag flying) fruit, nuts, raisins and coffee, the post prandial was started. In passing I may remark that the Steward of the Crescent Club called this a "Shore Dinner." The only plain dentist present said it was a "sure enough dinner" but the specialists shrugged their shoulders and called it a "fair" meal.

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THE PURPOSE OF THE CONVOCATION was explained as follows: "Gentlemen, you are all specialists, and you all ought to be dentists. Undoubtedly when you meet Around the Table with your brother specialists you talk the technique of your special branches, but tonight you are all segregated if considered as specialists, though congregated if counted as dentists. Thus no one of you has a neighbor practicing in his own particular field exclusively, and if you talk at all you must fashion your speech so as to be comprehended by the other specialists present. Each of you therefore will be asked to speak, in order to test the proposition that we are still all practicing parts of the great calling 'dentistry'; that we all are or should be interdependent, which must mean mutually useful one to the other. The request is made then, that, in turn, each of you will endeavor to say something, or tell something that will be helpful to one or more of the other specialists present. The Pathodontists being the latest arrival in the world of specialdom, and consequently the least removed from the broad sphere of dentistry, we will hear from him first."

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THE PATHODONTIST RESPONDED AS FOLLOWS: "Mr. Toastmaster and fellow 'dontists,' and let me say also fellow dentists, my task seems rather an easy one. First, however, let us understand just what is meant by Pathodontist. The Editor of Dental Items of Interest editorially declared recently that in his pages Pathodontia will include all diseased conditions of the teeth, and this perhaps is correct enough from a purely etymological standpoint. But as a member of the Section on Pathodontia of the First District Dental Society I wish it understood that in that Section we confine our studies more particularly to root canal work, and it will therefore be as a root canal technician that I will speak.

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"MORE PARTICULARLY I will address myself to the Periodontist present. It seems to me that the majority of Periodontists are incorrectly limiting their field. I know of several who receive a patient for the treatment of what is ordinarily known as pyorrhea, but which

perhaps at this time I should call periodontoclasia; upon examination of the mouth clinically and with the aid of the Roentgen ray it is found that the periodontoclasia is complicated by the presence of unfilled root canals and consequent disease of the apical pericementum. Because he is specializing, and because he considers that the referring dentist will be disgruntled if he should undertake all of the work himself, the type of Periodontist to which I am alluding feels called upon to refer the patient back to his dentist for root canal treatment.

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"IN MY OPINION THIS is a mistake. If the Periodontist were having patients sent to him by only one dentist, and if he could know that that particularly dentist were skilled in root canal technique it would be forgivable. I use the word forgivable, because it is unforgivable to undertake the cure of a patient's diseased condition and then through some mistaken notion of professional etiquette have an essential part of the treatment conducted by unskilled hands.

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"ROOT CANAL TREATMENT connects the Pathodontist with the Prosthodontist quite as closely as with the Periodontist, and all that I have said applies equally in crown and bridgework. The specialist in that line should be as skilled in rendering his foundations safe from disease, as he is in building his superstructure."

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TOASTMASTER: "It seems in proper sequence now to ask the Periodontist to reply."

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THE PERIODONTIST: "Brothers, there is no doubt, or should not be any doubt, that we all are interrelated. The last speaker pointed out the link that binds his specialty with two others. My own field is bounded on all sides by other specialties. At the apical end of the tooth we meet the Pathodontist, using the term as did the last speaker; on the morsal end we find the maker of inlays and fillings; approximally we meet the Prosthodontist and occlusally we either bless or damn the Orthodontist, dependent perhaps upon whether we send the patient to him, or he to us.

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"THE PATHODONTIST has brought up a nice point, but it is one I think which has almost finally been settled by all classes of specialists. At this time I think we have the right to say to the referring dentist: 'If you wish me to be responsible for results you must grant me the privilege of doing for this patient whatever I think it may be essential for me to do myself.' Note this last. I claim the

❖ right to do for the patient whatever I can do myself. I do not ❖ think it would be a professional possibility to receive a patient from ❖ one practitioner and then refer him to another for a part of the ❖ work. Yet sometimes it does occur that we know that the referring ❖ dentist would be incompetent to handle the case. This makes an ❖ embarrassing situation, but it should be solved in the interest of the ❖ patient. ❖ ❖

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"YET THE SOLUTION is not always easy. Formerly, when I thought ❖ it my duty to refer a patient back to his dentist for root canal treat- ❖ ment, I frequently found myself in awkward situations; particularly ❖ so when the radiograph disclosed faulty work which had been done ❖ by the referring dentist himself. ❖ ❖

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"CONSEQUENTLY I SOON LEARNED that, save in rare cases, I ❖ should undertake the root canal technique myself. There are a few ❖ exceptions of course. There are two or three skilful root canal ❖ technicians who refer patients to me for periodontoclasia, and it is ❖ a pleasure to work in coöperation with these men. And an advan- ❖ tage to the patients likewise, because with two men working, progress ❖ often is more rapid. ❖ ❖

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"IN REGARD TO other specialists I have little trouble. Where bridge- ❖ work is needed I refer my patients always to the same man, and the ❖ same is true where I need orthodontic aid. Fortunately no other ❖ Prosthodontist nor Orthodontist refers any patients to me, and there- ❖ fore I have no professional embarrassments in that direction. ❖ ❖

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"BUT I WOULD POINT OUT, Mr. Toastmaster, that though practic- ❖ ing as a specialist, I consider that what success I am having is largely ❖ due to the skilled assistance that I am able to receive from other ❖ specialists." ❖ ❖

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THE EXODONTIST NEXT ADDRESSED the company. "Mr. Toast- ❖ master, the last speaker told us the boundaries of his calling, and ❖ stated that he meets the Pathodontist at one end of the tooth, the ❖ Gold Inlay worker at the other, the Prosthodontist on each side ❖ and the Orthodontist when his patient opens and closes his mouth. ❖ He seems to have failed to recognize the proximity of my own ❖ specialty, but if he will look closely he will discover that the Perio- ❖ dontist is completely surrounded, so to speak, by the Exodontist. ❖

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"WE ARE OF GREAT ASSISTANCE to him at times. When he tells a

❖ patient that a certain tooth is incurable, and we extract the tooth, ❖ the patient can never more prove that it might have been cured. ❖ Again, when he undertakes to cure a tooth and fails, a swift turn of ❖ our forceps removes all evidence of his dereliction. Hence, you see, ❖ we should be close friends (laughter). ❖ ❖

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"SPEAKING SERIOUSLY, however, let me say this. The radiograph ❖ tells us many things, but there are some things not recorded by the ❖ rays. For example, a radiograph of two pulpless teeth may show ❖ slight and seemingly curable, so-called pyorrhea pockets; both teeth ❖ may have apparently perfect root canal fillings. Neither may have ❖ any radiolucent area about the apex. In other words, both teeth may ❖ seem to be similar, radiographically considered. ❖ ❖

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"ONE TOOTH YIELDS readily to treatment, and the other continues ❖ to have a pus discharge from the pocket. In despair at last the ❖ Periodontist sends his patient to the Exodontist and the tooth is ❖ extracted. The mystery is solved at once. The root of the tooth ❖ has so long been pus-soaked that it is actually discolored. Probably ❖ the tooth that recovered reached the referring dentist with a living, ❖ healthy, though exposed pulp. Pulp removal and good root canal ❖ filling left it in a curable condition for the Periodontist. The other ❖ may have been suffering with an open cavity and a putrescent pulp ❖ for years, and because the discharge escaped through the canal into ❖ the mouth there was little if any apical disturbance; not sufficient ❖ to show in a radiograph at all events. But in such cases the dentinal ❖ walls of the canal become more and more deeply infected, and ❖ when the dentist comes to treat such a case he either does not, or ❖ probably cannot, sterilize such tooth structure. He places a perfect ❖ root filling perhaps, and he may even safeguard the apical area, ❖ but that pus-soaked tooth, now sealed at both ends of its canal, ❖ becomes more than ever a menace and a source of infection to the ❖ surrounding pericementum. ❖ ❖

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"YOU, MR. PERIODONTIST, may operate again and again; you may ❖ scrape away carious alveolar process; you may scrape away rough- ❖ ened cementum and necrotic pericementum, but to really scrape away ❖ all the infected tooth substance you would need to scrape away the ❖ entire root, and your patient will find it easier to have the Exodon- ❖ tist do that with the forceps. ❖ ❖

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"THERE IS ANOTHER ASPECT of this subject of the interrelation- ❖ ship of the specialists. One handicap that the specialist has is that

❖ having started in his professional work as a general practitioner he ❖ has inherited the dogma, 'Save teeth.' And though an Exodontist ❖ I likewise say 'save teeth.' By all means save all teeth that can be ❖ made healthy. But do not save unhealthy teeth, because the un- ❖ healthy tooth is a precursor of the unhealthy man. ❖ ❖

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"TO THE PERIODONTIST THEREFORE my advice would be to ❖ classify the teeth in a prospective patient as incurable, curable, and ❖ doubtful. In treatment, the first step should be to remove the in- ❖ curable teeth, because the diseased tooth is surrounded by diseased ❖ soft and hard tissues, and with the removal of such teeth these ❖ tissues may be reduced to a state of health. This will at once make ❖ your doubtful teeth less doubtful. These doubtful teeth should ❖ then be treated only long enough to test their response to treatment, ❖ whereupon they should be again classified as 'too doubtful,' and 'still ❖ doubtful.' Those that are 'too doubtful' should be removed. This ❖ brings the oral cavity into a still higher state of health, makes the ❖ diseased teeth more amenable to treatment and the further judg- ❖ ment, as to what can and what cannot be cured, more certain. ❖ ❖

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"BY REPEATED BRIEF TREATMENTS, followed by extractions, we ❖ will much sooner have left in the mouth only such teeth as can be ❖ made entirely healthy. Moreover the examination of the roots ❖ of the extracted teeth would frequently determine the extent to ❖ which the teeth in that particular mouth might be irretrievably pus- ❖ soaked and hence incurable. ❖ ❖

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"TO THE PATHODONTIST ALSO I have a word of warning. It ❖ would not be professional for me to particularize, nor to mention ❖ names. Suffice it to say that the Exodontist is a sort of clearing ❖ house for the failures of other specialists, and we see the work of ❖ many men, good, bad and indifferent. Too often some of our best ❖ Pathodontists flatter themselves that they have effected cures, when ❖ indeed they have not. Unfortunately it is not always easy to decide, ❖ without extraction, whether a so-called granuloma has been elimi- ❖ nated or not. I do know that I have extracted teeth, 'cured' by ❖ some of our best men, and have found granulomas still attached. ❖

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"IN CASES WHERE THERE ARE no systemic complications it may be ❖ safe to take risks, but in other cases I would recommend that if abso- ❖ lute radiographic proof of complete clearing up is not obtainable ❖ very promptly, it would be better for the patient to lose the tooth, ❖ or at least to have the doubtful area cleaned up surgically." ❖ ❖

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THE ORTHODONTIST was called for next and responded as follows:

"Of course we all must admit the interrelation of the various specialties in dentistry, and my own field is just as closely allied to others as are those that have already been discussed. One relation of particular interest to me is the failure of the dentist to properly contour inlays or fillings, either before or after the patient reaches my hands. If the faulty work is in the mouth when the patient first comes to me, I investigate first as to whether the over-full occlusal inlays were placed by the referring dentist, or by some previous attendant. If they had been inserted by the referring dentist the situation occasionally becomes acute. If the man is amenable to reason, why of course I reason with him. I take my models to his office, have a frank heart to heart talk with him, and the corrections in the form of the fillings, or inlays, are made by him.

"BUT WHERE THE DENTIST is unreasonable, why of course it is a useless waste of time to reason with him. Sometimes, where the dentist is a comparative stranger, I can tell in advance that it would be senseless to consult with him.

"FOR EXAMPLE, only recently I had a patient whose mandibular first molars had just been inlayed by the referring dentist. The case was what we call a Class II. condition. The mandibular molars had large cavities, and evidently the dentist had pushed in some pattern wax, asked the girl to close her mouth, and then had simply trimmed away the excess from about the margins, and had used the wax as a pattern for his inlay, with no alteration whatever in the occlusal surface.

"WHAT WAS WORSE, he had made a very accurate casting in some hard gold, so that the teeth when closed were practically locked in their malrelations. The gold was so hard that it would have been hazardous to attempt to remove the inlays, and it was long and tedious work to grind them down and carve them into some semblance of tooth form.

"YET THAT WAS WHAT I DID, and what I invariably do when I fear a complication by attempting a comment on the work of the dentist. It must not be forgotten that to induce the referring dentist to remove and replace his own inlays, discloses to the patient the fact that the work was incorrectly done. On the other hand, a bit of grinding and polishing of inlays from time to time, by the Orthodontist, can be accomplished without reflection upon the dentist. Thus

all amenities are met and the patient's interest conserved at the same time.

"OUR FRIEND THE EXODONTIST has given some salutary advice to other specialists present, so perhaps he would not object to receiving a little. I would especially warn not only Exodontists but likewise all general practitioners, against the unconsidered removal of temporary teeth. To remove a temporary molar prematurely on the advice of an Orthodontist who immediately takes steps to retain the space left, may be entirely excusable. But the premature extraction of temporary molars without such after treatment may result in disaster.

"A SINGLE CASE HISTORY will point the moral at which I am aiming. Experience, they say, is the best teacher, and by this standard I have been well taught. Early in my career I had been treating a child during the winter and at the time of retention I conceived the idea of removing the four temporary molars to hasten the eruption of the bicuspids. The teeth were extracted without first making any radiographic examination.

"DURING THE SUMMER the upper retainer became loosened by 'Salt-water Taffy,' and the appliance was somewhat bent, for which reason it was removed by a local dentist.

"IN THE AUTUMN it was found that three of the bicuspids had partially erupted, but the fourth was not in sight, and a radiograph disclosed that it was still high up in the alveolus.

"THE MAXILLARY MOLAR on that side, however, had drifted forward to a very considerable extent. Special appliances were necessary to move the molar back to place, and as the bicuspid did not erupt for eighteen months, the child was put to much unnecessary treatment, all of which might have been avoided had a radiograph been taken prior to extraction.

"THE ORTHODONTIST touches the sphere of the Periodontist of course in cases of so-called traumatic occlusion, and by coöperation may render valuable assistance. He touches the realm of the Prosthodontist in cases of marked tipping or drifting of teeth due to loss of other teeth, and often if called in could greatly reduce the labors of his confrere by a little advance treatment. But the sphere of the Prosthodontist touches that of the Orthodontist at another point and I do not find that thus far the contact has been very help-

❖ ful. Perhaps the Prosthodontist present might talk a bit on that
❖ problem. ❖ ❖

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"I AM ALLUDING to conditions where teeth are congenitally absent in
❖ the mouths of young patients. The ideal restoration of occlu-
❖ sion would require an adjustment of the teeth into normal align-
❖ ment and occlusion with their antagonists of the opposing jaw. But
❖ such procedure will leave spaces. The filling of these spaces, in
❖ young arches, seems to be a problem not as yet met by the bridge-
❖ worker." ❖ ❖

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THE PROSTHODONTIST being called then, replied as follows: "The
❖ problem suggested by our friend the Orthodontist, he says has not
❖ been solved by the bridgeworker. Well, why should it be solved by
❖ the bridgeworker? Is bridgework the panacea of all ills? The
❖ more advanced standards of bridgework to-day require that the
❖ appliance should be removable. Also that it should be firmly fixed
❖ when in place, having no more, and no less movement than would
❖ the normal natural tooth. This entails an attachment to the natural
❖ teeth present in the mouth. Such attachments would require the
❖ cutting of cavities in the teeth, and in a young patient with teeth
❖ not yet very densely calcified such a course would be prohibitive. ❖

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"IF WE CANNOT DO THE BEST operation, because of the age of the
❖ patient, why then we must wait until the age of the patient is no
❖ hindrance. Meanwhile we must temporize. If the missing tooth
❖ is in a conspicuous part of the mouth it should be replaced of course,
❖ and in most cases a gold roof-plate carrying the needed tooth, and
❖ without clasps will be found to answer all purposes. If it is neces-
❖ sary to use clasps they should be of the skeleton type and usually
❖ may extend over the occlusal ends of the teeth, impinging upon the
❖ buccal surface of a tooth on each side of the jaw. Commonly the
❖ occlusion is not so accurate, even when the correction has been made
❖ by our best Orthodontists, but that space can be found for the
❖ passage of a light wire. ❖ ❖

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"BUT IN CASE NO SUCH SPACE exists, or if such type of retention
❖ seems contraindicated, there is usually some other way. For example
❖ a filling, or inlay upon the lingual surface of two molars, and made
❖ of platinized gold, if formed into a wart-like excrescence will permit
❖ a wire spring to lodge below it, and give us all the retention required.

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"THE REALM OF THE PROSTHODONTIST crosses the path of the
❖ Pathodontist of course, but then the Prosthodontist should be a

❖ Pathodontist himself. Otherwise he is a mere mechanic. Pros-
❖ thodontia touches Periodontia at a point of important contact.
❖ Peridontists of the past have used fixed splints in the treatment of
❖ loose diseased teeth. I wish to enter the most definite protest against
❖ such procedure. ❖ ❖

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"IN THE FIRST PLACE it is contrary to all the rules of surgery. What
❖ would we think of a surgeon who placed a broken leg in a plaster
❖ bandage and left the bandage on for life? Coming nearer home,
❖ what would we think of an oral surgeon who permanently cemented
❖ a splint to the teeth, in a case of fracture of the mandible? In
❖ principle it is just as reprehensible to permanently bind a lot of
❖ loose diseased teeth together. ❖ ❖

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"WHAT GOOD PURPOSE is accomplished by the splint? The teeth
❖ being loose, are fastened together to minimize the possibility of
❖ motion during treatment, which includes the removal of dead or
❖ diseased tissues and the replacement of the same by healthy, new
❖ tissue. Fixation of the teeth aids this work of repair. But not
❖ permanent fixation. ❖ ❖

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"NO TOOTH SHOULD be permitted to remain in the mouth which
❖ cannot be so cured by treatment that it will not require artificial sup-
❖ port to perform its natural function. ❖ ❖

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"IF SEVERAL DISEASED TEETH be permanently united by a fixed
❖ splint, and all are cured except one, the splint is holding in the
❖ mouth a tooth that should be out of the mouth, and if left in it will
❖ undoubtedly spread disease to the adjacent teeth. ❖ ❖

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"THERE ARE OTHER POTENT OBJECTIONS to the fixed splint, but
❖ the one cited is sufficient to condemn the practice. ❖ ❖

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"A PROPERLY CONSTRUCTED removable splint will accomplish all
❖ the good that can be gained by fixation, and its removal allows the
❖ operator to examine the teeth individually and thus test the degree
❖ of actual cure that is being accomplished. By this means he avoids
❖ deceiving himself. Better still, he avoids deceiving the patient." ❖

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A RADIODONTIST had been invited but was unable to attend this little
❖ dinner. Perhaps he, or some other of that cult, may be tempted to
❖ send us his comments upon the interrelation of the specialties. There
❖ are some Radiodontists who believe that no other specialist can suc-

❖ ceed without their aid, yet certain Radiodontists of this type whom
❖ we have in mind, really know very little of any other specialty, and
❖ not over much of Radiodontia. 1919.

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COMMENT. The above Talk invites very little comment. Prior to,
❖ and up to that time, the dogmatic doctrine was that the Orthodon-
❖ tist should place every tooth in the patient's arches in their proper
❖ position, and in proper occlusal relationship with their normal antag-
❖ onists. Such treatment, as mentioned, frequently left spaces, and
❖ the Orthodontist bequethed these spaces to the kindly care of some
❖ Prosthodontist, smugly satisfied that he had done his duty. ❖ ❖

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SINCE THEN we hear a great deal about conservative treatment, and
❖ many Orthodontists are rearranging the natural organs to eliminate
❖ spaces, feeling that the patient will be better served with a compara-
❖ tively good occlusal arrangement, and no artificial substitutes, than
❖ he would be with academically correct occlusion of the natural
❖ organs, but with a few china teeth held in place by what a dentist
❖ recently well denominated as "a barbed wire entanglement." ❖

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BY THIS METHOD of procedure the Prosthodontist is not so fre-
❖ quently, as formerly, called upon to supply artificial dentures in im-
❖ mature arches. Meanwhile Prosthodontia has made such progress
❖ that the specialist of today is better qualified than ever, to solve
❖ any such problems as may be referred to him by Orthodontists. ❖

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I NOTE ONE EPIGRAMMATIC statement by the Prosthodontist,
❖ which is so sound in doctrine and so well expressed that it might
❖ well be writ in gold and hung in every dental office, preferably
❖ where both the Patient and the Dentist may see it. To stamp it
❖ upon the mind of the reader it is here repeated. It reads: ❖ ❖

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"NO TOOTH should be permitted to remain in the mouth, which cannot
❖ be so cured by treatment, that it will not require artificial support
❖ to perform its natural function." 1928.

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XXXIV.

HAVE YOU EVER NOTICED how different folks express the same thoughts? And yet how readily you comprehend their meaning? Not always, of course. But sometimes. For example:

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I REMEMBER ONE DAY, in the college infirmary, I was working on a specimen of what, in those days, was known as the Bowery Tough Boy. I was rapidly, and perhaps none too carefully removing leathery decay from a large lower molar, when suddenly the patient, (why these folks are called "patient" I never did know) the patient grabbed my hand in a vice-like grip and bellowed at me: "Say! What do you think I am? A Dead One?" And I knew at once that he thought I had already gone far enough in one direction.

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ANOTHER TIME I was operating on what we used to call a "Big Buck Negro." I comprehend the "Big" and the "Negro," but why "Buck" I cannot tell you. Though he "bucked" on this occasion! I thought that I was carefully and painlessly peeling, layer after layer of leathery decay from this negro's tooth cavity, when to my surprise he sat up very straight in the chair and in most polite tones remarked: "Scuse me Boss, but if you goes any deeper, you'll get down to my pussonality." And I knew just what he meant.

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AFTER GOING INTO PRACTICE, "on my own," one of the first patients who risked herself in my care was an elderly Irish lady. She came in with a market basket on her arm and a shawl over her head, and asked: "Is this a place where they fix tathe?" Being assured that she had come to the right shop, she deposited her basket on the floor where she could keep at least one eye on it, sat in my chair and "took a chance." That is slang and inelegant I know, but when one peers backward into the past, one must tell the truth, must not one? She certainly was taking a chance! Well anyway, pretty soon, I was pretty deep into that leathery decay, while the patient (patient again) had both hands and feet braced against accessible parts of the chair. Then, just as I lifted away the last bit of decay and saw the blood spurt, this Dear Old Irish Lady cried

out: "For the love of Mike, man! You're down to the quick." I had never heard it called by that name, but I comprehended the new nomenclature at once.

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WELL, TIME HAS FLED, as time will flit, and recently I heard the same sort of statement, though quite differently phrased. This time it was a professor in Columbia University. And just at a crucial moment in my operation the spirit, or something, moved him to enter into conversation with me, and this is what he quietly remarked: "Doctor, I deem it my duty to warn you that you seem to be approaching the stratum furiosum." And there you are! Or rather there I was.

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NOW STRATUM FURIOSUM is not half bad, and perhaps it might be a good point at which to stop and think awhile. Thus stopping and thinking, and more especially retrospecting as it were, I note one feature in common in all four of the above case histories. In each instance I was lifting leathery decay from a deep cavity, with every prospect of uncovering the pulp if all decalcified dentin were removed, and in each instance the patient's judgment was to the effect that I had "gone far enough." Each patient was willing to have me stop! Worth thinking about, is it not? Patients ought to have some voice in such matters? What?

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THEN AGAIN IT OCCURS to me now, though it did not occur to me then, that perhaps all four of those pulps might have been saved alive, only at that time I did not know enough to know that. And this brings us another reflection worth reflecting about. An honorable professional man, and we are all that, are we not? An honorable professional man always does what he thinks is best. Trouble is he does not always know what is best. But the greatest trouble, trouble for the patient I mean, is when the dentist is so sure that he knows what is best, that really he never comes to know any better.

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AND SO, TIME WAS when I thought the salvation of a pulp a most doubtful operation. And I think so yet; in many cases. But the removal of a pulp and treatment of the root canals? What of that? Any doubt there? If so, then should we not weigh doubt against doubt, and give the patient the benefit of the doubt? The lesser doubt?

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AS A FUNDAMENTAL PRINCIPLE of cavity preparation I was taught to remove all decay. From this hypothesis we easily arrive at "extension for prevention," which, as you all know, is a short way of say-

ing extension of cavity margins for the prevention of recurrence of decay. In the latter propaganda the rule is that all enamel must be removed that is not supported by sound dentin. Hence of course all unsound dentin must come away in order that we might determine how much enamel to remove. This brings us back to the absolutely scientific doctrine that we must remove all decalcified dentin.

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THIS IN TURN brings us down to the Professor's **stratum furiosum,** and at this stratum we find it the universal opinion of patients that we should stop; whereas the scientist tells us to continue. Now if we think that we know more than our patients, and most of us do, we follow the scientific method and we remove that **stratum furiosum.** But if we do that we "draw blood," do we not? We do! What then? Pulp exposure! What then? An exposed pulp that has bled cannot heal up again. Or can it? How is that anyway? Who really knows?

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MUCH DEPENDS ON HOW you answer that question. If you decide that a pulp that has bled cannot heal up (or down) why you must remove that pulp. So then you remove it; or think you do! Anyway, you do the best you can to remove that pulp. You have read all the expert testimony, and you have attended a lot of lectures, and three postgraduate courses, and consequently, at least you know you are doing your work in a thoroughly scientific manner. What more, can any patient ask? Fact is if he asks for more he is not patient, is he?

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VERY WELL THEN! You take that pulp out, or think you do, but the tooth is sore. That is, the patient says so. You explain that it is not really "sore" but just "tender." Patient insists it is "sore," distinctly sore, and as it is a tender subject you drop it. Then what do you do? Why, several things can be done, but you remember the old adage: "Time is a great healer," so you give it time. And in time it is healed. Maybe the iodin helped, and perhaps the ice-bag too, but time was the principal factor.

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SO AFTER A TIME you undertake to fill that root canal, and you prove it up with a radiograph. And you see that you not only have filled that root to the end, but about a block and a half farther. Oh well! You have been told that that will do no harm, and being of a hopeful disposition you hope that it will not. But you have wisdom and experience, and you remember all the fool questions that patient asked while that tooth was "sore" the first time. So you

take time by the forelock as it were, and remembering that time cured that tooth the last time, you give it plenty of time. You give her an appointment two weeks off. And when at last she comes back, she tells you that "the tooth hurt like Sam Hill for a few days, but then it passed off, and it is all right now." And you are gratified and glad that you gave that tooth plenty of time. And you are glad you practice in a truly scientific manner.

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AND THEN A YEAR LATER you take a radiograph of that region for some reason, and your filled root gets into the picture, and then— But why talk about painful subjects? You can't always rely on a radiograph anyway, can you now?

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SO NOW LET US FORGET all that; it was only supposition anyway. Let us "have another suppose," as it were. Suppose then that when we reach that **stratum furiosum**, and that patient remarks: "Ouch!" or "Goody-Lordy!" or "Man alive!" or any of those quaint remarks that patients are so liable to release from their system in times of stress; suppose that we abandon the scientific way, and follow the suggestion of the patient, and go no farther! What then? Why we have to think a bit, do we not?

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WELL, I HAVE BEEN THINKING about this and thinking pretty seriously for a long, long time. And with your kind permission I will here set down the substance of my pondering. I think there is one point we can all agree on. Not original at all I assure you. A much wiser man than I said it first. "The best root filling is a living, healthy pulp." Not just a "living" pulp, mind you, but a "living, healthy" pulp.

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WHEN WE GET DOWN to that **stratum furiosum** therefore we can either lift it off, rupture the pulp capillaries, and render its preservation doubtful; or we can leave that decalcified dentin in the tooth, cover it over with something or other, and fill the tooth, leaving a living pulp in the canal. The patient is satisfied because you did not proceed after he said "Ouch!" And also because the tooth is "comfortable" afterwards. We are satisfied because our patient is satisfied and calls us a "painless" dentist and pays our bill cheerfully. But while we left a living pulp in that tooth, did we fully obey the mandate of that Wise Man and leave a living, healthy pulp therein? "Ah! There's the rub!" as Hamlet or some one of his friends once remarked.

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THIS REMINDS US of another familiar old saw: "Time will tell," time

❖ you know being a great tattle-tale. But when time tells the final ❖
❖ tale about that tooth, the patient's face is so fat she can hardly repeat ❖
❖ the story when she calls. But then the fact speaks for itself, and ❖
❖ tells you the whole story, and it is a short story at that. ❖ ❖

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THAT PULP HAS DIED! ❖ ❖

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YES SIR! THAT PULP HAS DIED, and that tooth is not tender; ❖
❖ it is sore; and the patient is sore. And you wish that beautiful gold ❖
❖ inlay were made out of gutta-percha. Well, such is life! ❖ ❖

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SO YOU SEE, if you leave a pulp in a tooth it must be not only a living ❖
❖ pulp, it must be a living, healthy pulp. And not only healthy, but ❖
❖ not apt to get sick. ❖ ❖

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NOW THEN, WHAT MAKES a pulp sick? We used to say that a ❖
❖ dangerous menace to a pulp is "thermal shock." We never said ❖
❖ "heat and cold," but always "thermal shock." You see, we must ❖
❖ arrange our nomenclature so that the erudite, and the Bostonians, ❖
❖ can comprehend us. Hence of course it was long ago discovered ❖
❖ that "thermal shock" must be guarded against. To accomplish this, ❖
❖ doubtfully deep cavities were always filled with cement, or gutta- ❖
❖ percha for a while. Cement was admittedly not so good a "shock ❖
❖ absorber" as gutta-percha, but if the tooth did remain comfortable ❖
❖ with cement, it would only be necessary to take out about half of it ❖
❖ and the metal filling could go in. ❖ ❖

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AND THEN, DAD BLAME IT, we had a lot of pulps die under our ❖
❖ beautiful contoured gold fillings (old style, hammered in and square ❖
❖ on top) and we had to scientifically investigate that. Some man, ❖
❖ wiser than the rest of us, discovered that in our cements there is al- ❖
❖ ways a trace of arsenic, and of course the arsenic in the cement ❖
❖ killed the pulps, while the cement itself was saving them from death ❖
❖ by thermal shock. Nice piece of business, was it not? ❖ ❖

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BUT THERE ARE SCIENTISTS AND SCIENTISTS. So what one ❖
❖ man proves today, another man disproves tomorrow. This death ❖
❖ dealing power of cement had a vogue for quite a time, and then, ❖
❖ Lo! another and a wiser man, pointed out that arsenic always kills ❖
❖ a pulp. Hence if it was arsenic in cements that killed the pulps, why ❖
❖ then all teeth with cement fillings in them would also have dead ❖
❖ pulps. Hence cement does not kill a pulp. Q. E. D., as we logicians ❖
❖ express it. ❖ ❖

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AND IT WAS RATHER EASY to prove that thousands of pulps remained alive under cement fillings. Still, a goodly number of pulps do die under cement. How about that, if there is no arsenic in the cement, and if the cement prevents thermal shock? Simple enough when you come to think of it. If neither of two explanations explain, there must be a third explanation.

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AND SO THERE WAS! Next discoverey was that the pulps that die under cement were half dead, or at least very ill, when the cement was placed over them.

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SO NOW WE HAVE BEEN AROUND the circle, quite a vicious circle, and we get back to that tooth with the **stratum furiosum**, and a pulp under it that we want to save. The solution of our difficulty lies in the fact that if the pulp is not very sick, and if it has vital resistance enough to recover, it will recover. Perfectly safe statement that, because if you follow the following method, which at last we are going to describe, and your pulp dies, why we can always tell you that your pulp was either too ill to be saved, or else did not have sufficient vital resistance.

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IN DECIDING THEREFORE to try to preserve a pulp alive, it is requisite first to make sure, if you can, that the pulp is not already so badly diseased that recovery is impossible. Secondly, to determine whether the vital resistance will be great enough to effect a recovery under favorable circumstances. These then are the premises, but the premises are not always easily occupied.

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AS TO THE PHYSICAL condition of a pulp, much will depend upon symptoms, and these in turn will depend much upon the ailment. It is known of course that a pulp may become injured traumatically, as from a blow, or from too rapid movement during orthodontic treatment; also that a healthy pulp in a sound tooth may become diseased by infection through the apex from an adjacent diseased tooth. But these are exceptions and need not be considered here. Our main discussion is in connection with pulps infected, or at least affected through the approach of caries.

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SOME HAVE DECLARED that if the decalcified layer of dentin (leathery decay) reaches the pulp, that pulp is always infected. But this may not be true. Bacteria can be recovered from scrapings around the gums of any person, yet the person may not have pyorrhea, nor any other gum disease. The tissues may be infested, but not

infected. There is quite a difference, but we cannot take time for that now.

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THE POINT IS that decalcified dentin may be filled with germs and may even reach the pulp, and yet the pulp may remain in a state of health through its power of resistance. But one cannot expect this to continue indefinitely. Hence if we are to attempt to save the pulp alive we must first make an effort to sterilize the decalcified dentin which is to be left immediately over the pulp, and the cavity should be tentatively filled, with an easily removed filling, for a sufficient time to determine the result of the operation.

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IN A LECTURE recently delivered by Dr. Percy R. Howe of Boston, he declared that in young teeth, mark that, in young teeth, his silver deposit method may be used to sterilize the decalcified dentin and convert it into a safe and satisfactory pulp capping. He reported over nine hundred teeth so treated in one year at the Forsyth Infirmary with only eighteen pulp deaths. This is a noteworthy record, even if those pulps that died were not "too ill" at the time of treatment. We have evidence here of a wonderful recuperative power in young pulps, which probably have a higher vital resistance than could be found in older teeth.

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AT THE SAME MEETING Dr. Herman Prinz declared that a capping with a paste of eugenol and zinc oxid had saved many pulps and he recommended the practice in carefully selected cases.

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THE WRITER HAS been cautiously testing out pulp capping in selected cases in young teeth, meaning patients under fifteen and having a healthy and vital physical endowment. Successful experiments, during the past two years, in about ten cases, tempts one to extend the treatment beyond the age of fifteen, always remembering that the older the pulp the less the chance of success with pulp capping.

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THE METHOD is as follows: The decalcified dentin must first be treated with oil of cloves (the active principle of which is said to be eugenol) for at least two weeks. This both sterilizes and hardens the decalcified dentin. The dressings should be sealed in with one of the temporary cements. If all seems propitious after two to four weeks the tooth is isolated with the rubber dam, thoroughly dried with hot air, and a paste, made of zinc oxid and oil of cloves spread over the floor of the cavity. This is covered with a concaved metallic cap, preferably of iridio-platinum. This concaved cap is filled with

the paste, and carefully placed in the cavity, so as to bridge over the possible point of exposure of the pulp and thus serve as a protection against masticatory stress. This cap also prevents the admixture of the oil of cloves paste, with the oxyphosphate. Over this metallic cap is placed a covering of oxyphosphate cement, mixed to a dough-like consistency and carefully packed in the cavity and against the side walls.

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TWO POINTS ARE TO BE ACCENTUATED. First that this method is only recommended in cavities where the decalcified dentin overlying the pulp is in the form known as leathery decay. A pulp underlying truly carious and fully disintegrated dentin is not a "good risk," as our insurance friends would say. Second, as much of the decalcified dentin must be removed as can be removed without exposure of the pulp. This particularly means that small spoon excavators should be carefully used around the periphery of the cavity, completely removing all decalcified dentin from the juncture of the enamel and dentin immediately under the cusps. Occasionally it will be safer to leave this till after the cement has set, as at that time it can be removed without danger of peeling up a layer that will extend across the floor of the cavity and perhaps expose the pulp, causing it to bleed. But, before placing any permanent filling, all this decalcified dentin, under the occlusal enamel, must be removed so that the true limitations of extension for prevention principles may be indicated.

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IN PASSING THIS SUBJECT for the present, we wish it understood that nothing in the foregoing is meant to cast a doubt upon the possibility of properly filling root canals. Root canals can be perfectly filled—sometimes!

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BUT THE BEST root canal filling is a "living, healthy" pulp. 1919.

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COMMENT. Within the past eighteen months considerable attention has been given (in print) to the subject of pulp capping, and to bring this up to date, I shall quote from three authorities.

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IN FEBRUARY, 1927 (Dental Items of Interest), Dr. Elmer Best published an article entitled, "An Operation That May Make Root Canal Work Unnecessary," from which the following excerpts are quoted:

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"THERE IS A UNANIMITY of opinion that the safest possible type

of teeth are those with vital pulps and healthy supporting tissues. Hence, the writer has ceased to give any more time or thought to the never ceasing arguments, pro and con, regarding the **status quo** of pulpless teeth, and for some time past has concentrated on an operation for saving vital pulps, when the vitality of such pulps is threatened. It is my conclusion, based on the most concentrated efforts of which I am capable, that the removal of a vital pulp is a distinct calamity and must be an admission of defeat on the part of the operator. At the very best it is fraught with the gravest danger. There can be no argument about it.

"SOME YEARS AGO, the writer became impressed with the fact that the solution of the question lay primarily in a refinement of our diagnosis, just as much as in the perfecting of a root canal operation. While the latter offered a big field for development, owing to the conditions continually revealed by the x-ray, yet it was exceedingly apparent that some means must be employed to solve the problem of teeth having extensive caries, in some way other than by pulp removal. This was revealed when, after an extensive study of a large number of cases, it was found that the great majority of teeth had lost their pulps, due to the presence of deep-seated caries. Experience had taught dentists that it was highly unsatisfactory to place fillings in such teeth, as pulpitis frequently followed which would necessitate the removal of the pulps. Hence the pulps were removed before placing the fillings.

"TWO AVENUES WERE OPEN at that time, as a solution of the problem of the disposition of the dental pulp in the case of deep-seated caries. They were pulp-capping as a cure, and oral prophylaxis as a prevention. A review of the literature on pulp-capping gave but slight encouragement, as it was found that the majority of writers had but slight confidence in it. Was it not possible that the same factors existed where attempts have been made to save pulps in a vital condition in those teeth where extensive caries existed? A series of cases was run through for observation and the results checked carefully. Only those cases were selected where ordinarily the pulp would have been removed, or the tooth extracted, due to the extent of the caries. The vitality of the pulp having been determined, the rubber dam was applied and the overhanging enamel chipped away. With curettes the carious dentin was cautiously removed. Due to previous unsatisfactory experiences in pulp capping, precautions were taken at all times to prevent exposure of the pulp if at all possible. At first, the value of this pre-

caution was not demonstrated, but the writer is now convinced that it is one of the most important steps in the operation.

"TECHNIQUE FOR PULP CAPPING. After removing all of the carious dentin from the side walls of the cavity, the pulpal and axial walls are attacked. With good vision and access, this dentin is cautiously removed and the cavity is well cleansed, but the pulp is not exposed, even though a layer of involved dentin is all that prevents its exposure. It is thoroughly irrigated with warmed Dakin's solution. This mopping or sponging process should be kept up for ten or fifteen minutes. The cavity is then dried and Steridents, which consists of zinc, magnesia, silver nitrate powder and eugenol, is mixed to a fairly thick consistency and a drop placed in the base of the cavity with a fine probe. With a small, dry pellet of cotton, the Steridents is gently spread over the floor. Excavators are now used to trim the Steridents away from the margins; particularly from the gingival margin.

"WHILE THE MATERIAL contains silver nitrate, yet if due precaution is taken to keep it away from the margins, no discoloration will be apparent. The next step is to cover the Steridents with oxy-chlorid of zinc cement. Oxy-chlorid is used for the reason that it is one of the very few cements through which moisture will not pass. After the oxy-chlorid of zinc is put in place, the cavity is filled with oxy-phosphate cement, the occlusion is tested with carbon paper and relieved. The tooth is given a period of rest. If no symptoms contraindicate the procedure, the permanent restoration is put in place in a few weeks.

"THIS OPERATION does not lend itself to a careless or indifferent technique, but must be carried out with the closest attention to detail. The results observed in the series of cases referred to were astounding. Pulps for which but little hope could be held out, were found to retain their vitality and an absence of unfavorable symptoms, together with encouraging radiographic evidence, seemed to indicate success. Further observations justified a feeling of optimism, and after considerable time the operation was adopted as practical. It is here offered as a contribution to modern preventive dentistry."

NEXT I SHALL QUOTE from Dr. George W. Warner, of Denver, Col., who presented a paper, entitled "Pulp Conservation," in October, 1927, in Dental Items of Interest. In part he tells us:

"THE PREPARATION which we have used all these years, and are now

using, for capping exposed pulps, and for protecting sensitive dentin permanently as a cavity lining, or temporarily in cavities prepared for inlays or bridge abutments, or as a seal for treatments, consists of the following ingredients: the powder: zinc oxid and bismuth subnitrate; the liquid: eugenic acid, thymol and iodin. The physiologic action of these drugs is as follows: Oxid of zinc is a mild astringent. Bismuth subnitrate is mildly antiseptic and astringent. Eugenic acid, the active principle of oil of cloves, a highly refined product, acts as a stimulant to the animal cell and is an antiseptic. It also possesses a marked sedative and analgesic property. Iodin is antiseptic and stimulating.

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"THIS PREPARATION, in practically its present form, was developed by the late Dr. R. G. Gardenier, formerly of Cheyenne, Wyoming, and later of San Diego, California. Dr. Gardenier was one of the most thoroughly conscientious and highly skilled of the old school of practitioners. In his early life he had had special pharmaceutical training and for years maintained active study and experimentation in organic chemistry. He perfected the above formula to his satisfaction over thirty years ago, and for years it was used only in his own practice and by a few of his friends whom he kept supplied with the preparation.

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"IT SOUNDS COMMONPLACE to say that when these drugs are pure and are compounded in the right proportions, the resulting compound is antiseptic, analgesic and stimulating in just the right degree for pulp tissue; but nevertheless, long experience of many operators seems to have proven this to be true.

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"WE CALL this preparation 'Sedative Sement,' because it has a sedative action on an exposed or irritated pulp. It will be called by this name in this paper.

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"SCIENTIFIC TESTS as to the bacteriacidal action of this preparation have not been made. The drugs contained in the preparation and clinical evidence, support the theory that bacterial growth is at least inhibited. Hopewell-Smith says, 'The use of aseptic sterilizing agents for the purpose of inhibiting the growth, or actually destroying the bacteria involved in the carious process is strongly indicated.'

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"DATA IN RELATION to the bacterial invasion of pulps has been given us by Henrici and Hartzell. How deeply the bacteria penetrate, how effectively phagocytosis is carried on in the pulp,

what may be the pulp's power of recovery from infection, depend upon many factors, local and general. Noyes and other histologists seem to have conclusively demonstrated the presence of lymphatics in dental pulp tissue, which they state should provide this tissue with the same or similar recuperative power as other tissues of the body. Hopewell-Smith thinks that the published reports of Schweitzer, Dewey and Noyes that the pulp contains special lymph capillaries and valvular vessels containing lymph and lymphocytes, has not been absolutely determined. But he says further that 'a lymphatic system is not required, because the whole tissue is bathed in lymph like every other connective tissue of the body, including even dense, compact, hyaline cartilage.' He says also in the same article that the vascular system is so constructed that the parts may return to normal condition after injury or disease.

"IN THE SAME ARTICLE he also treats of the formation of adventitious dentin, in which he says that its formation 'means the gradual reduction of the cubic capacity of the pulp cavity; leads to a restriction in the complete and perfect use of the physiological activities of its containing organ; brings about a limitation of its powers of healing; increases its difficulties of overcoming the advancing destruction, and ends in the lowering of the vitality of the tissue and inducing a general predisposition to degeneration or inflammation.'

"EFFECTS OF SEDATIVE SEMENT. The rationale of the use of 'sedative sement' rests upon these conditions, for, contrary to the action of irritating substances, it dose not cause the formation of adventitious dentin. Pulp cappings of 'sedative sement' when removed, even several years after placing, reveal the pulp and surrounding dentin, as far as the unaided eyes can determine, just as when the capping was placed.

"WE HAVE COME TO RECOGNIZE certain subjective and objective manifestations of the pulp as indicative of the probability of its recovery from inflammatory conditions due to carious invasion, if the above described preparation is used in the manner to be hereinafter described.

"SUBJECTIVE SYMPTOMS IN PULP IRRITATION. We will first consider some of the subjective symptoms of pulp irritation and the probable results of treatment. If a tooth is slightly sensitive to thermal shock from cold only, and an exposure of the pulp is made in removing carious dentin, the pulp will usually recover upon treatment with the 'sedative sement' above referred to. If a tooth is

❖ acutely sensitive to thermal shock from cold it will usually recover ❖ its normal tone upon treatment with 'sedative sement,' even though ❖ an exposure is made in excavating the carious dentin. If a tooth is ❖ acutely sensitive to cold and heat, but has ached only a few hours, ❖ it will frequently recover when 'sedative sement' is applied, even ❖ though an exposure is made in excavating the carious dentin. It ❖ is probable that all of the above hypothetical cases are cases of ❖ hyperemia of the pulp, expressing itself in accordance with the ❖ fundamental differences of the parent organism and the differences ❖ in condition of resistance or health at the time. Thoma says ❖ 'Hyperemia of the pulp is a reaction to the mildest form of injurious ❖ agents, such as physical or chemical irritation of short duration. If ❖ the irritation is removed in time, the condition will return to normal. ❖ Even if the hyperemia is caused by a mechanical exposure, it will ❖ return to normal, provided that the reaction is not severe enough, ❖ and of such long duration, as to cause strangulation at the apex, ❖ which, of course, is less liable to happen in young teeth.' ❖ ❖

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"IF A TOOTH HAS ACHED very acutely for several hours, it will ❖ usually 'die' whatever may be done for it; but, if the objective ❖ symptoms are favorable, we would thoroughly excavate the carious ❖ dentin and use the 'sedative sement' as a temporary filling. If the ❖ pain ceases, a 'sedative sement' pulp capping is made and a temporary ❖ cotton impregnated 'sedative sement' filling is introduced, which is ❖ left in situ for several weeks, if the tooth is reasonably comfortable. ❖ The tooth is then tested by thermal shock and radiographed. If it ❖ responds to ice and the apical periodontal membrane seems normal, ❖ as shown by the radiograph, a permanent filling is made. ❖ ❖

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"OBJECTIVE SYMPTOMS IN PULP IRRITATION. The above is a ❖ description of the methods of treatment and expected results based ❖ upon subjective symptoms only. However, our present method is ❖ to radiograph immediately when a case of suspected pulp exposure ❖ presents. As a matter of fact, it is our rule to make a complete ❖ radiographic examination of every new case, and, as patients are ❖ apt to come to a dental office because of pain or discomfort, it is ❖ not uncommon for the radiographs to reveal deep caries, if not ❖ more serious pathological changes. If, however, a patient presents, ❖ complaining of some one tooth, we radiograph that tooth and then ❖ base our diagnosis on the subjective and objective symptoms, includ- ❖ ing the radiographic findings. Thus: if a tooth is sensitive to cold ❖ only, but shows a decided thickening of the apical periodontal mem- ❖ brane, our prognosis is unfavorable. Conversely, if the tooth is ❖ sensitive to cold and heat and has ached quite hard, but the radio-

graph shows an apparently normal apical periodontal membrane, the prognosis is more favorable. If a tooth has deep caries and also deep periodontoclasial destruction, all other symptoms, both subjective and objective, are made less favorable than in a case with a fairly normal periodontium. If a tooth is sore to pressure the prognosis is less favorable, even with subjective symptoms reasonably favorable and radiographic findings not markedly unfavorable. It might be said, however, that if a tooth has been sore to pressure several days, the radiographic findings will usually be unfavorable. The possible combination of symptoms, subjective and objective, are too numerous to consider further in this paper, but enough has been given to be a guide in the use of 'sedative sement.'

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"NOW AS TO MORE DETAILED instructions in the preparation for, and use of 'sedative sement.' It is the firm belief of the writer and his associates that all demonstrable decay should be removed when so-called 'permanent' work is to be done. The word 'permanent' is used with a full realization of the relativity of its meaning in connection with anything in the human body. If carious dentin is impregnated with bacterial life, it would seem reasonable to suppose that the more thoroughly and completely it is removed, the greater will be the hope of sterilizing the remaining dentin and relieving the pulp from the irritating effects of bacterial poisons.

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"IN THESE CASES JUST mentioned, and in cases where the carious process has deeply invaded the dentin, the health of the pulp is best conserved by introducing a layer of 'sedative sement' on the axial or pulpal wall, before introducing any other filling material. It will be found after once this practice is started that 'sedative sement' will be used in all cavities where its presence will not lessen the bulk of the exposed filling material to the point of weakness. Teeth treated in this manner do not often have recurrent decay under the fillings and rarely have pulp disturbance.

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"TREATMENT OF PULP EXPOSURE. When we find it necessary to expose a pulp, in removing carious dentin, we believe it should be done with a sharp excavator, or sharp bur, large enough in either instance to preclude the possibility of plunging into the pulp. This should be considered a surgical operation and the same precautions against bruising the tissues, particularly the pulp tissue, should be observed, as in an abdominal operation. If just a slight exposure is made and the surrounding dentin seems normal, the 'sedative sement' may be flowed or teased over the exposure at once. If the expos-

❖ ure is large, or a portion of the pulp is cut off in the removal of
❖ carious dentin, it is well to allow the pulp to bleed as freely as it
❖ will, and then to wash the cavity thoroughly with warm water. After
❖ this has been done dry the cavity, preferably with sterile spunk or
❖ bibulous paper and then flow or tease the 'sedative sement' over
❖ the exposure. Allow this to harden a few minutes under a water-
❖ soaked pledget of cotton, when it will be safe to dry the cavity with
❖ spunk or bibulous paper and fill it with 'sedative cement' worked into
❖ dry cotton or asbestos fibre. The cotton or asbestos fibre aids in
❖ maintaining the integrity of the filling and allows its removal en
❖ **masse.** This temporary 'sedative sement' filling may be left in
❖ place a few days, or a few weeks, as conditions may indicate. If
❖ the tooth remains comfortable and responds fairly normally to
❖ thermal shock, the permanent filling may be placed after a few days
❖ or weeks. ❖ ❖

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"IF THE EXPOSURE is extremely large, if the pulp is much congested,
❖ or if it is necessary to cut away much pulp tissue, it is wise to put in
❖ a cotton dressing saturated with the liquid; this is then covered with
❖ 'sedative sement.' This should be removed in a day or two and if
❖ the pulp then seems normal, as indicated by appearance and response
❖ of the tooth to thermal shock, one might cap the pulp as directed
❖ above. Take note, however, that we do not consider it wise to at-
❖ tempt the capping of an exposed pulp if the radiograph shows much
❖ thickening of the apical portion of the periodontal membrane, or of
❖ the lamina dura." ❖ ❖

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HAVING BRIEFLY MENTIONED Prof. Prinz's method views in 1919,
❖ it will be of interest to quote what he has to say in 1928. The
❖ following is from his recently published text-book "Diseases of the
❖ Soft Structures of the Teeth and Their Treatment" an admirable
❖ work, sound in doctrine throughout. ❖ ❖

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HE SAYS, " 'Pulp Capping,' as this process of applying a protective
❖ medium to the exposed pulp is technically known, will always remain,
❖ relatively speaking, even under the very best possible conditions an
❖ operation of chance. Nevertheless the writer cannot subscribe to the
❖ supposed authoritative statements of certain practitioners, namely,
❖ that it is always a failure." ❖ ❖

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PROFESSOR PRINZ then proceeds to tell us when, why and how to cap
❖ pulps, all of which is most interesting, and scientifically sound. I
❖ do not feel at liberty to quote his entire chapter dealing with this
❖ subject, but I trust that Prof. Prinz will pardon my presenting just

enough, to make my readers become his readers, by buying his book. Prof. Prinz tells us how to select teeth for pulp capping, as follows:

"INDICATIONS FOR CAPPING A HEALTHY EXPOSED PULP.—The indications for 'capping' a healthy pulp, i.e., covering of the exposed pulp with a protective aseptic material, may be summarized as follows:

"1. ONLY PERFECTLY HEALTHY exposed pulps which are not, or are only very slightly, wounded, offer suitable cases for this operation. A healthy exposed pulp has a pink color; an inflamed pulp appears as a bluish-red pulsating tissue, trying to protrude through the broken pulpal wall.

"2. THE HEALTHY PULPS of temporary or permanent teeth whose roots are not fully completed offer the best chances for capping. Pulp growth denotes functional activity, i.e., physiologic hyperemia, hence such pulps exhibit marked properties of repair.

"3. THE PULPS IN the teeth of advanced adults and those pulps which show signs of degeneration are not suitable for capping. The latter usually undergo atrophic changes and are ready to succumb at the slightest provocation.

"4. PULPS IN FULLY FORMED teeth exposed by caries, erosion, abrasion, etc., and those lacerated by the revolving engine bur, should never be capped."

UNDER THE CAPTION "Treatment" Prof. Prinz tells us:

"STRONG ANTISEPTICS must be rigidly avoided; the very delicate pulp is too easily injured by most of these compounds. A pellet of cotton moistened with a weak dichloramin-T solution is placed gently over the pulp exposure, to act as a protective against infection, but primarily to prevent its drying out. Irreparable shrinkage will occur if this phase of the operation is overlooked. The cavity is prepared with sterile hand instruments, the cotton pellet is removed and the cavity is dried with a fresh piece of sterile cotton, but never with the warm air blast. A bit of pulp-capping material, consisting of 2 parts of zinc oxid and 1 part of thymol, is taken up with a warm suitably shaped instrument, carried to the edge of, but not upon, the exposure and with a warm amalgam plugger the material which has become plastic by the heat of the instrument is

molded very gently and without the least pressure over the opening. The operator, especially the beginner, is cautioned against the use of a large quantity of capping material. Only enough should be employed to cover the exposure and its edges. The capping sets almost immediately.

"A SUITABLE PULP-CAPPING may be prepared as follows: One part of thymol is melted in a porcelain capsule and mixed with 2 parts of dry zinc oxid. The mixture is spread on a glass slab and on cooling it is removed and preserved in a well-stoppered bottle."

IT IS A GRATIFICATION to quote the above from so high an authority as Prof. Prinz, because the method is so nearly similar to my own. Indeed he also tells us that some operators prefer to cover their capping material with a concaved metallic disk, which has been my invariable custom for many years.

IN REGARD to the capping cements recommended by Dr. Best and Dr. Warner, Sterident and Sedative Sement, I take pleasure in stating that I have used both with apparent success thus far. Indeed it would seem that any bland antiseptic paste may be utilized, and that success will depend, A, upon the condition of the pulp; B, the gentle and antiseptic methods of the operator, and, C, a capping so placed that it cannot exert pressure upon the pulp, for which reason the concaved metallic disk is recommended. 1928.

XXXV.

SEVERAL INTERESTING LETTERS from Club members have been in our letter box for some time. Difficulty is, our membership is so scattered about the country that we receive comments on our January report after we have really compiled the records of the February meeting. However, you all keep the back numbers, do you not? You do! Hence if you do not exactly catch the drift of an argument just turn back to the Table Talk mentioned and all will be clear to your mind.

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HERE, FOR EXAMPLE, is a communication from Brother Robert Burns of San Francisco, dated December 17th, 1918. Brother Burns is so pessimistic that one wonders whether at that time he was not paying out just a little more for Christmas presents than he ever expected Santa Claus to bring back to him. However, we must look at dental problems from every point of view, so, to get a correct orientation, let us consider the opinions of a gentleman in the occident. Here is the letter:

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"YOUR 'AROUND THE TABLE' talk-fest of November has so interested me that I can not resist getting a little of the emotion 'off my chest.'

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"WHY DISCUSS THE POSSIBILITY of placing perfect root-canal fillings? There simply 'an't no such thing.' At least not with any of the materials at present at the command of the dental profession.

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"HOWEVER, JUST TO STOP ARGUMENT on that score, let us assume that a root-canal can be thoroughly sterilized, that a canal filling can be so placed as to seal said canal sufficiently well to prevent the re-entrance of bacteria. What then? What in the world is going to prevent that root from becoming infected sooner or later? For a tooth from which the pulp has been removed is a DEAD thing in every sense of the word. It has had its blood supply permanently shut off; it is composed of about 28% organic matter, subject to putrefaction and infection just as is any other organic matter; it stands in a hot, moist medium swarming with bacteria. Would you expect any other portion of the human

❖ anatomy similarly placed to be an element conducive to the future
❖ well-being, happiness and longevity of the patient? ❖ ❖

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"LET US STRETCH OUR IMAGINATION severely for a moment and
❖ suppose that you, Mr. Editor, knew of 'a case' where a general
❖ surgeon, or even a specialist, had left a piece of dead bone in the
❖ jaw without means of blood supply, would you not expect it to be
❖ exfoliated? Now wouldn't you really? And, as a matter of sober
❖ fact, is not that just the very thing that happens to every single dead
❖ tooth that ever was embalmed, or encapsulated, or enshrined, in the
❖ pages of the 'Items' as an example of a perfectly placed plug of a
❖ root-canal filling. So there! ❖ ❖

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"I WILL GRANT that the process of exfoliation goes on slowly; very,
❖ very slowly sometimes, and that in a certain percentage of cases—
❖ number unknown, statistics doubtful—there is a possibility that the
❖ wonderful tolerance and defensive forces of a beneficent Providence
❖ may guard the patient from harm; at least from any harm that may
❖ be made manifest to our restricted vision, or to the trials of our
❖ rather crude and ineffective measures of physical diagnosis. But
❖ how about the vast number of individuals, never quite well, never
❖ very sick, whose lives are a constant struggle against a low-grade in-
❖ fection about dead teeth that locally give no marked symptoms,
❖ that 'never bother' the patient, that even 'look good' in the radio-
❖ graph; and yet when such teeth are properly removed, in about three
❖ months the patient gains a little in weight and a whole lot in 'pep.'
❖ Have you never had such cases? I have. ❖ ❖

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"BY THE WAY, PLEASE NOTE that above I said 'the process of ex-
❖ foliation goes on slowly.' It often occurs that the dead tooth is
❖ never fully exfoliated. But always upon proper examination will be
❖ found evidence of effort to throw out the offending member. The
❖ next fifty dead teeth that you extract, just see if fifty of them do
❖ not 'smell bad'; see if they are not brittle, more easily cut by the
❖ bur; see even if the gum tissue about them is as healthy as about
❖ vital teeth; look them over closely, then ask yourself honestly if
❖ you would like to have one of the stinking things in your own
❖ mouth. Finally, of course, you will have been sure to have taken
❖ cultures. You will find that you have just fifty, positive. The
❖ proportion will hold good whether you try it in fifty, or five hun-
❖ dred, or five thousand cases. ❖ ❖

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"NOW, MR. EDITOR, you are a powerful factor in directing the trend

❖ of dental thought in these United States of ours. If you ever should ❖ take it into your head to convince the dentists of America that dead ❖ teeth are dangerous you would do more to make Dentistry safe for ❖ Democracy than Mr. Wilson can do for the aforementioned De- ❖ mocracy in all the hobnobbing he can do with a passing royalty in ❖ this revolutionary world of ours." ❖ ❖

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NOW, BROTHER BURNS, just what is it that you want me to do? Go ❖ out into the Dental Wilderness and preach sermons from your text? ❖ Or shall I preach sermons from my own texts? Shall I try to form, ❖ or reform the opinions of dentists in accord with your experience, ❖ or in accord with my own? If, as you say, I am a factor in directing ❖ the trend of dental thought in this country—note that I say if—but ❖ if so, then it seems to me that I should not endeavor to make men ❖ believe what you think, nor what I think, but rather to state facts ❖ as recorded by many men, and let each man think for himself. ❖

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READING OVER YOUR LAST paragraph, however, I now note that ❖ you want me to preach that "dead teeth are dangerous." Well, I ❖ can do that with an easy conscience, because I agree with you abso- ❖ lutely, and I think that every thinking man will agree with both of ❖ us. Certainly a tooth that will stink after extraction, should be ❖ extracted and the cause of the stink removed from the system as ❖ quickly as possible. ❖ ❖

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QUESTION IS, HOWEVER, that you are apparently calling teeth ❖ "dead" that I and many others would not call dead, but merely ❖ "pulpless."

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YOU SAY that "a tooth from which the pulp has been removed is a dead ❖ thing in every sense of the word. It has had its blood supply ❖ permanently shut off, etc." ❖ ❖

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SUPPOSE WE STUDY that a bit, because it is important. No need to ❖ lecture on histology; we can manage with just a few simple homely ❖ terms. The tooth germ then is first composed entirely of soft tissue. ❖ This has the function of forming tooth bone; first the enamel cap, ❖ and then under and within that, the dentin internally and the ❖ cementum externally. It is with these two latter hard tissues that ❖ we are now concerned. And we note one peculiarity in common, ❖ each is in contact with a soft tissue. The cementum is surrounded ❖ by the pericementum, and the dentin surrounds the pulp. These ❖ two soft tissues have likewise one thing in common; each is supplied ❖ with nerve tissue and blood vessels. Whence comes this blood

supply? Is the vascular system of the pulp separate and distinct from that of the pericementum?

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TO DETERMINE THIS we must go back to the germ period of the tooth and here we find that the blood supply is a single system, with branches reaching that which is to be pulp and that which is to be pericementum. Later we find (see works of Vida Latham and others) that the vessels of the pericementum and of the dentin not only unite just beyond the apical foramen, or foramena as the case may be, but often they anastamose through cementum and dentin.

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MOREOVER the junction of the dentin and cementum is not a mere mechanical contact, but a real vital union, and this must mean if it means anything that a tooth is not a "dead tooth" until pulp, dentin, cementum and pericementum are all dead. Until then it may exist in all stages of partial death, and it may be so near death, so positively doomed, that the dentist should extract it before complete death supervenes. This brings us to the great problem of diagnosis, but it does not substantiate Brother Burns's claim that "a tooth from which a pulp has been removed is a dead thing in every sense of the word."

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TO GET ANOTHER ANGLE on this discussion let us just consider the various stages of tooth death, as it commonly occurs. First we have a solution of the protective enamel and initial caries of the dentin. Carious dentin is dead dentin, is it not? But we do not extract the tooth, merely because a part of it is dead. We remove the dead part and preserve the living. We insert a filling.

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IF NOT TREATED, THE CARIES progresses. More dentin dies, and the septic poisons reach the pulp. The pulp then is sick, because it is adjacent to dead matter, and as Dr. Burns has pointed out, Nature abhors dead material. But a pulp also often has great vitality, and just as a sick man may recover from his sickness, so a sick pulp, if helped in time, may recover. Please accent the words "in time," and "may."

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NOW WE HAVE a tooth, part of which is dead, and the pulp in which is sick. Do we extract the tooth? Not always. What treatment then? Same as before. Remove the dead parts and heal the sick. This is surgery, if you please! Dental surgery! To cut away the dead and hopelessly diseased parts in the hope of restoring the sick parts to a state of health.

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IF THIS IS NOT ACCOMPLISHED we have further decay, death, of more dentin, and further infection and death of the pulp. And later still infection along the walls of the canal. If treatment supervenes before death of the pulp, and that organ is removed prior to infection of the dentin along the canal walls, all the tooth is still alive and still in a state of health, if the dead dentin be removed and also the dying pulp. And what is left is still alive because it is sustained through the pericementum.

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BUT IF A DEAD PULP be left to putrify and thus infect the dentin of the canal, we arrive at the serious problem: "Can infected dentin be sterilized?" This is a serious problem because if the dentin of a tooth root once be infected, it must either be sterilized, or else we must anticipate that the infection will be progressive.

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WHEN INFECTION within a canal is permitted to remain there, its easiest and most natural vent will be through the foramen, thus carrying infection to the pericementum. And now we have the last source of vitality of the tooth attacked. And when finally the pericementum is destroyed we have of course a dead tooth; one that must be extracted; one that stinks after extraction.

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THIS CONDITION, of which stench is a symptom, may of course occur before the complete death of a tooth, because it is a common accompaniment of necrosis, and frequently teeth are exfoliated so slowly that there is necrosis of a considerable portion of the pericementum prior to final loss of the tooth.

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A SIMILAR vicious circle may begin with the pericementum, which is first infected, then seriously diseased, the disease passing through the foramen, infecting and finally causing the death of the pulp. Indeed this routine is more crtain to cause the loss of the tooth than the first. A tooth without a pulp may exist with a living pericementum, but no tooth can have a living pulp if its pericementum be destroyed. Thus easily is it demonstrated that the pericementum is of more value to an adult tooth than its pulp.

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IN ONE PLACE I have stated that a sick pulp may be made healthy, sometimes. This then is a good point at which to refer you to the Table Talk in the April issue (Talk No. XXXIV.) and to introduce a nice letter from Brother Clarence Grieves, at present serving our Country in the Navy. Brother Grieves sends us the following very gracious letter:

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"I HAVE READ VERY CAREFULLY your Table Talk in April issue." (A compliment occurs here, but is omitted.) "This type of presentation really does better missionary work than many, very many serious papers. I believe the solution of this whole problem, as you have heard me say before, lies in the development of some accurate means of pulp diagnosis. At present, outside of pain, we have none. If we could diagnose pulp conditions we could successfully cap many pulps. I am convinced that in some types, Streptococci reach the pulp long before actual pulp exposure. For over five years my office has practiced the attempt to sterilize (?) all vital dentin, (any cavity where dentin was moderately exposed) by oil of cloves with ten per cent. cresol. This, for the reason mentioned in my papers, that both of these substances are best in the histological laboratory for penetrating bone, cementum and dentin. So I like your oil of cloves but would add ten per cent. pure (alkaline) Beechwood creosote. P. S. I like your point as to the comparative risk of the best canal methods and the best pulp capping."

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COMING BACK to Brother Burns of San Francisco, or, rather, going only half way back, as far as Ottawa, Kansas, we have a very pertinent question asked by Brother F. O. Hetrick of that famous village. He writes as follows:

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"I HAVE A TOPIC for a table talk that I should think will be very potent sometime within the next fifty years. Said topic reads as follows: 'Is it ever wise to attempt to save a two- or three-rooted tooth which has become infected?' I am keeping pretty close tabs on the work of some of the best men in the country and I have concluded that they and some of the commoner crew of dentists might have saved a lot of sin and suffering had they extracted such teeth instanter. Recently I extracted one from which the operator claimed that he had cleared up the infection at the apical end of the root but the Cocci family had occupied apartments about half way up the mesial wall of the palatal root and was not disturbed much by what went on at the apex. I also have tested a number of the new type of specialists, who call themselves 'exodontists' and they claim they are harvesting quite a crop of teeth whose root ends have been amputated."

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BROTHER HETRICK ASKS whether it ever is wise to attempt to save a two- or three-rooted tooth which has become infected. The wisdom of the attempt would be just in proportion to the wisdom of the attempter. If the root or roots cannot be saved, it would be unwise to attempt to save. Otherwise, it would be wise. 1919.

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XXXVI.

SIXTY SECONDS make one minute, but sixty minutes make one mad; ❖ that is to say, when one selects the fastest train to go home on and ❖ finds it one hour late when one reaches the depot. Do you agree ❖ with me? You do! And then presently when you guilelessly ask ❖ the Station Attendant: "Will that train make up any of her lost ❖ time?" and he gently replies: "Hardly think so. Just heard she ❖ is one hour and a half late out of Buffalo." What do you say to ❖ that? Why, nothing, of course. What is the use, anyway? Even ❖ if you took the trolley from Syracuse to New York, that late Lake ❖ Shore Limited would beat you home. Would it not? It would! ❖

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SO YOU JUST SIT on one of the nice soft wooden seats, and you won- ❖ der. And one of the things you wonder is, whether any one would ❖ ever believe that a hot box at Buffalo, that makes a train late reach- ❖ ing Syracuse, could be the initial cause of spreading good dental ❖ information to men in Chicago, Denver, San Francisco, and way sta- ❖ tions. Seems impossible, yet so it is. ❖ ❖

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YOU SEE, I HAD BEEN ATTENDING the meeting of the New York ❖ State Dental Society, and was mad, and getting madder, in that ❖ station waiting for that belated train, when who should arrive but ❖ that well-known authority on bridgework, Dr. George Evans. ❖ ❖

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HE SAUNTERED IN, saw me, crossed over, and sat beside. We scolded ❖ awhile, condoled awhile, and then sort of drifted onto the subject ❖ of bridgework. After that he talked, and I listened, and, do you ❖ know, that hour and a half speeded by so rapidly that I actually ❖ nearly missed my train, I was so surprised when it did come along.

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I SAID THAT we drifted onto the subject of bridgework, and so that ❖ you may catch the drift of Dr. Evans's little lecture I should per- ❖ haps explain that we had been listening to quite some talk on the ❖ subject up at the meeting. Dr. Ward—Ward, of Ann Arbor, of ❖ course—had presented his views upon the general subject, pointing ❖ out where fixed bridges might be used, decrying the perniciousness

of the removal of pulps in order to insert removable bridges, etc., etc. And Dr. Burgess had agreed with Dr. Ward and declared that fixed bridgework is usually just as clean as the natural teeth in the same mouth, provided that the bridge were properly made; and that removable bridges are just as dirty as the natural teeth in the mouth of a person who takes a bath once a year "whether he needs it or not," etc., etc. And some one else had said that fixed bridges are usually removable in time, the abutments coming away at the same time; and it was stated that "teeth move in function"; and we heard a certain man declare that he "would not have a devital tooth (whatever that is) in his mouth for a thousand dollars, because it is abnormal"; and another man said that china substitutes for extracted teeth are also abnormal; and somebody else said that if we thoroughly understand the sympathetic nervous system we would comprehend that fixed bridgework might be tolerated in a man's mouth for years and years and years, and all the harm it would do would be the harm it does internally, and eternally, for years and years and years. Amen!

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AND WITHOUT BRAGGING, and without the aid of a stenographer, I make bold to declare that the above is a fairly good report of the discussion of bridgework at the recent meeting of the Dental Society of the State of New York. Don't you wish you might have been there?

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AND THEN I MET DR. EVANS at the railroad station, and he made a few sane remarks, which may be worth recording for the benefit of the other members of the club. It all started by my asking Dr. Evans his opinion as to the causes of failure of bridgework.

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"WE HEAR A GREAT DEAL these days," said he, "about diseased teeth under bridgework—teeth with roots only half filled, and with radiolucent and probably diseased areas shown in the radiographs. Some claim that the bridge failed because the root was not properly filled. Sometimes, of course, that is true. On the other hand, you can find many half-filled roots that are not diseased, so perhaps the root under a bridge may become diseased because it carries a bridge quite as much as because it is only half filled.

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"NOT THAT I WOULD SANCTION half-filled root canals. Every root canal should be cleansed and filled to the end. But the question is, sometimes, is this possible? And where it is not possible, what shall we do? Suppose you have an elderly healthy man; elderly perhaps because he is healthy. You find a molar remaining on one

❖ side. If you could use it as an abutment you could give the man a ❖ thoroughly satisfactory bridge. If you extract it, he must go without ❖ teeth, wear a plate, or have an extension bridge, which latter is always ❖ the least satisfactory type of bridge, and the most difficult to make ❖ so that the abutments will not be destroyed thereby. ❖ ❖

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"WELL, YOU FIND IT necessary to remove that pulp. It is dead, yet ❖ the canals, as far as you can enter them, are odorless and dry. ❖ Your radiographs show no radiolucent areas, nor do they disclose ❖ any definite canals open to the apices. You use all the standard ❖ methods of clearing out the canals, from sulphuric acid, to drills ❖ and main strength, yet your diagnostic wires do not appear emerg- ❖ ing through those apical foramina into the Promised Land beyond, ❖ and therefore you are prevented from strategically forcing your ❖ gutta-percha through so that it forms an encapsulation, or what- ❖ not (better spelled 'knot' perhaps). ❖ ❖

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"WHAT DO YOU DO in such case? Do you strictly adhere to your ❖ platform principles? Do you extract because you cannot penetrate ❖ into the apical territory? Do you extract that tooth for fear that ❖ the man might, could, or would have rheumatism some day, or ❖ later? Are you more afraid that he will achieve arthritis with a ❖ bridge on such a tooth, than that he might get dyspepsia trying to ❖ chew candy with his gums? Oh, pardon! He could rely upon ❖ gumdrops, could he not? Leaving that aside, what would you do ❖ with that tooth—extract it and be sure that no systemic infection ❖ could follow, or 'take a chance,' as the boys say, and let this man ❖ enjoy his beefsteaks for a short time anyway? Oh, well, you need ❖ not answer if it would tend to incriminate you! ❖ ❖

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"BUT I WILL TELL you what I would do in such a case: I would keep ❖ that tooth and build that man a serviceable bridge. Of course, I ❖ would cleanse, ream and remove as much as possible with safety. ❖ But, having done my honest best to reach the ends of those roots, ❖ and having failed because of secondary dentin blocking the canals— ❖ always remembering that we do not suspect any apical infection— ❖ I would then dry my roots out with heat, getting them as thoroughly ❖ dry as possible, and then saturate the canals with a solution of ❖ aristol and oil of cloves. In doubtful cases I would repeat this ❖ treatment at several sittings. I have done this sometimes until the ❖ dentin was positively stained, thus proving that it had been pene- ❖ trated by the medicaments. ❖ ❖

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"THIS IS NOT presented as a cure-all. It is not a treatment for dis-

eased teeth, nor is it advocated for the man too lazy to cleanse canals to their ends. But I can say that where I have relied upon it, in selected cases, it has been a friend in need. I have practiced in this manner for many years, and since the advent of the Roentgen ray I have seen radiographs of a number of roots so treated years ago, which showed no radiolucency even though the canal fillings had not reached the ends of the roots."

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AT THIS POINT in the writing out of this record I was obliged to stop for the night, and now I am able to relate a singular coincidence. I was asked today by a dental confrere to see a patient in consultation with him. Do not feel worried—I am not going to bore you with a case history, the patient being the wife of a millionaire railroad man, etc., etc., etc. You have heard hundreds of those stories. The point is that this patient's radiographs showed eight pulpless teeth, of which six had been crowned. Practically none had been filled to the apical end. Several showed distinct radiolucent areas, and all looked "suspicious," the least suspicious one having a fistula, which dispelled all doubts as to infection. Yet the upper thirds of these canals did not show clear. I therefore asked: "Do you recall whether you used any sort of paste in these roots that might account for the indistinctness of the canals?" And his reply was: "Very likely, because for years I have been starting my root canal fillings with a paste made of aristol in creosote."

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I INTERRUPT DR. EVANS to relate this occurrence because I would not have any one quote him as asserting that teeth can be made safe by filling or treating the roots with aristol and oil of cloves. So, Dear Brother, please read over what Dr. Evans did say, so that when you repeat it Around Some Table you will not quote him as saying something that he did not say. You will observe that it was in a very exceptional and carefully selected case that Brother Evans used a tooth as a support for a bridge without filling the root canals actually to the ends. But let us hark back to Brother Evans's monologue and hearken to what he has to tell.

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"BUT YOU ASKED ME," said Dr. Evans, "why bridgework fails. We heard a good deal today about cleanliness and uncleanliness; about fixed bridges and unfixed bridges; but let me tell you that one of the most constant causes of failure is a faulty occlusion. And even when the occlusion is correct at the time of inserting the bridge, it may become faulty as time goes on.

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"PORCELAIN TEETH are much more artistic than the all-gold dummy, but in one sense the latter has an advantage. Many patients who apply for bridge restorations show that they are powerful masticators. They eat hard foodstuffs, use their jaws forcefully and grind, grind, grind. You note that the incisal and occlusal enamel has been worn through at many places. You fill a gap in that man's mouth with two or three teeth, and you make the occlusion absolutely correct. You test it in all the excursions of the mandible, and all is entirely to your satisfaction.

"A FEW YEARS LATER he calls again, complaining of the teeth that occlude with your bridge dummies. He tells you that they are sore. You examine, and you tell him 'Pyorrhea!' But do you tell him why the pyorrhea? You do not! Perhaps you have never thought out the reason. Yet it is plain enough. Putting in that bridge will not alter that man's eating habits. He goes right on eating hard foodstuffs, and he continues to grind, grind, grind. Hence his natural teeth continue to wear away. But his china teeth do not, and consequently in time they are slightly above the occlusal plane. That is why gold masticating surfaces may serve better than porcelain, being more readily worn—or at least showing wear, and thus enabling the observant dentist to grind away and thus prevent what Dr. Stillman has warned us so often against, viz: traumatic occlusion.

"THIS IS ONE of the fruitful causes of traumatic occlusion. And it is not always the occluding teeth in the opposing jaw that suffer. Where the bridge is of the fixed type the abutments suffer, and where the abutments are alive when the bridge is first placed, often this induced traumatic occlusion results in the death of the pulps.

"HENCE IT IS VERY important that the occlusion of bridge pieces should be very carefully thought out. In mouths of persons with forceful masticating habits, as evidenced by extensive wear of the natural organs, I deem it wise to fashion the bridge slightly short of the occlusal plane, and then to warn the patient to keep under constant observation.

"THIS MATTER OF OCCLUSION is so important that I do not depend entirely upon my models. I deem it essential to finally occlude the teeth in the mouth. After all, however cleverly constructed modern articulators may be, the patient's mouth is the last and only reliable test. The fine adjustments of the occlusion demand some means of accurately recording the high spots, so to speak. We have all

used so-called 'tracing paper,' or 'carbon paper,' such as typewriters make copies with. But latterly I cannot get any really reliable paper, and I resort to other means.

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"A VERY GOOD PLAN is to mix rouge with oil and paint this onto the occluding surfaces. When thus painted, let the patient move his mandible about as in masticating, and the rouge and oil will mark the points that interfere, and these may then be ground away with very small carborundum stones. This rouge paste will serve even better than the carbon paper in many instances, especially where the polish on the gold or porcelain crowns is very high.

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"ANOTHER VERY GOOD PLAN is to coat the occlusal surfaces with a thin layer of melted wax. This may be melted on with a small spatula, or if paraffin or paraffin-wax be used, it may be made to spread over and coat the occlusal surfaces with a blast of hot air. The movements of the mandible will remove the wax from the points of interference and thus indicate where the stones are to be used."

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JUST AT THIS POINT my train was announced, and I had to run for it. Otherwise I am sure I would now be a wiser man, since the arrival of the train interrupted Dr. Evans's discourse. 1919.

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THE ABOVE was published in 1919, and in March, 1920, I find the following, which appears germane to this topic:

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I CANNOT RESIST THE TEMPTATION to tell the Club how I have attempted to procure correct occlusion in connection with bridgework. First let us understand just what we are talking about. Occlusion is said to be the correct relation of teeth when the jaws are closed. But for functional purposes something more than that must be read into the definition of occlusion. Perhaps we can best get at the hidden thought by taking a reverse view, as it were.

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TRAUMATIC OCCLUSION is such contact of the teeth when the jaws are closed that movement of the mandible with the teeth held in tight contact will cause undue stress upon one or more teeth due to a malrelation of the inclined planes. This condition is frequently attributable to faulty fillings or inlays, and in the absence of such fillings or inlays may be traced to uneven wear of the occlusal surfaces of the natural teeth, or to the malposition or malalignment of teeth, resulting from disease. So that we have in the last instance a

vicious circle. A state of disease producing a traumatic occlusion, and a traumatic occlusion preventing a return to a state of health.

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FUNCTIONAL OCCLUSION is a term that might be adopted to indicate such contact of the teeth when the jaws are closed that movement of the mandible with the teeth held in tight contact, or any normal functional movement of the mandible, will cause no undue stress upon any tooth or teeth.

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IT IS MANIFEST that to artificially produce such a relation it is needful that the articulator used should, with absolute accuracy, register all the normal, or even habitual movements of the mandible of the individual for whom the artificial substitutes are to be constructed. Can such an articulator be obtained?

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THE ONLY ABSOLUTELY reliable articulator which will record all the normal or habitual movements of an individual's mandible, is the jaws of the patient himself. The procedure then is as follows: Pursue the course which will obtain as accurate results as possible in the laboratory. A separate paper could be written on this subject. But at the moment we are discussing final results only.

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THE BRIDGE should be constructed with removable porcelains, later to be cemented to place. These porcelains should not be cemented in prior to the technique about to be described. The metal parts having been accurately and satisfactorily adjusted, the most distal porcelain is placed in its box and the patient asked to close his mouth, carbon paper having been inserted between the porcelain and the antagonizing natural teeth. The mandible is then moved about in all natural excursions, the carbon registering the faulty spots on the inclined planes. The porcelain is removed and the discolored spots very accurately ground away with the tiniest of carborundum stones, the inclined planes being thus formed in accommodation with the patient's habits. This operation is repeated until with the porcelain in place, and the forefinger of the operator's hand resting against the buccal surfaces of the porcelain and its natural antagonist, the patient holding his jaws rigidly together and then making slight but forceful lateral movement, fails to unduly move either the porcelain or the natural opposing tooth.

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THIS TECHNIQUE is followed with each porcelain separately, and when all are perfected their occlusal surfaces should be properly carved as to grooves and sulci, and then polished. They are then cemented to the bridge, after which, because of the presence of the

❖ cement, it may become necessary to rpeat the tests and do some
❖ final grinding and adjusting of the inclined planes. 1920.

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COMMENT. Quite frequently some dentist discovers something, a
❖ method, a short cut, or an idea, that he thinks is entirely original.
❖ Later he "discovers," that some other fellow discovered the same
❖ thing long before. ❖ ❖

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RECENTLY I have recommended the term "functional occlusion" and to
❖ my surprise I "discover" that I had presented the same idea eight
❖ years ago. 1928.

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XXXVII.

THIS IS THE FOURTH OF JULY! Independence Day! The day we celebrate! What is that? Celebrate? Where? How? Celebrate what? "Our independence," you say? Independence, forsooth! This year the boys and girls cannot have their crackers, and if the men and women have any crackers they have nothing to wash them down with. Of course in a few places you can get the kind they call 2.75 per cent., but who wants to do business on a 2.75 per cent. basis?

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ONLY FOUR DAYS since June! and, by the way, did you notice that June only had thirty days? Hard luck, was it not? Only four days gone, and what a change! Streets empty! Restaurants empty! Plenty of tables, but nobody to "Sit Around" with me. I have called up all the Metropolitan members of the club, but Central invariably says: "Out of town," wherever that is. Then she adds: "Why do you call people up on a holiday, anyway? Isn't it bad enough for a working girl to be kept here without guys like you making her do extra work?" "Work!" said I, irritated and dropping into slang. "Where do you get that stuff?" Like a flash she came back with: "You've got that wrong, Cutey. Nowadays you should say: 'Where do you get that stuff—at!'"

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SO THERE IT IS. Nobody in town except myself, and no one inviting me anywhere. So how shall I have a regular meeting of the Club? Oh, well, I have long been prepared for this emergency. Since there is no one to talk I am just going to read to you. Ever been read to? Awful bore sometimes, what? But not this time. I am going to read to you some interesting matter, and I shall try to prove to you just the opposite of what the authors meant their words to mean, and prove it without altering a word of their words. Interested? Well, read on, Thou Learned One, and learn some more.

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THE FIRST LESSON in reading will be from an article in the June issue of the National Dental Journal, by Dr. Edwin H. Mauk, of the University of California. The title is "Favorable and Unfavor-

able Conditions in Crown and Bridgework." Of course, you may have read this already, but I doubt if you all have. But even if you have, just let me read over a few passages to you and comment thereon.

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IN THE FIRST PLACE, let me say that this is the sanest and soundest paper on bridgework printed in many a day. I do not agree with all that the writer says, but I do with nearly all, and in regard to the other parts he may be right and I may be wrong. Indeed, that is just what we want to discover: what is right and what is wrong.

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ONE DEGRADING TRUTH, iterated by Dr. Mauk, with which we may all heartily agree, reads as follows:

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"WE MAY AS WELL REALIZE, also, that to free this art of the odium it has justly incurred, other favorable conditions must be present in a given case than the ability of the victim to pay, or the favorable condition of mind supposed to be brought about by the salesman-dentist applying the ready-made formulas of some 'System' of 'Dental Economics.'

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"THE REASON WHY the dentist includes crown and bridgework in his practice is too frequently not his knowledge nor skill along this line, but the fact that it is profitable. This constitutes the chief stumbling block in the way of all efforts to raise the status of the art as a whole.

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"ARE THE EXAMPLES numerous of the dentist 'referring' this class of work, as he does extracting or orthodontia, for instance? No, and we all know why. Its money-making possibilities are too great. This has fostered the growth of one of the greatest of present-day curses of dentistry: the commercial laboratory, whereby the dentist becomes all too often a mere commission merchant. It is a well-known fact that many students shuffle through dental prosthesis in college, both technical and practical, with the avowed purpose of having this work done by the laboratories after they enter office practice."

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THIS COMES TO US from a prominent college teacher who must know whereof he writes. Yet another college teacher scolds me a bit for fear that injustice may be done to the colleges if we ask them to bear some of the responsibility for the bad bridgework done in this day and generation. Yet Dr. Mauk tells us that: "It is a well-known fact that many students shuffle through dental prosthesis in

college, with the avowed purpose of having this work done by the laboratories after they enter practice." If this be a fact, and if it be well known, as Dr. Mauk says it is, then why are these men, who announce their intention of becoming dental slackers, permitted to "shuffle through"?

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IF THERE COULD be no shuffling through; if every man were compelled to prove his ability to do bridgework as it is taught, then it is hardly conceivable that he would accept work from a commercial laboratory unless it were as good as the work he could do himself, in which case there probably would be no great harm done. Dr. Mauk continues as follows:

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"IF A MAN IS INCAPABLE of executing every detail of his bridgework himself, or is incompetent to personally direct every step in his own laboratory, then he ought to let bridgework alone. It is almost certain that he will not have the judgment to properly prepare an abutment, or to know when technical procedures have been properly executed, to say nothing of elements of design, such as are involved in the incorporation of specific structural features."

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DR. MAUK HERE BRINGS forward a proposition well worthy of study. While regretting the prevalence of the purely commercial laboratory, nevertheless we can conceive of a division of labor in bridgework that would be of distinct advantage to both dentist and patient.

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DR. MAUK DECLARES that if a man be not possessed of the skill to execute every detail of his bridgework himself, he would be unable to properly prepare an abutment, etc., etc. In many cases this would be true, but not always. And it may be worth a moment's pause here to consider this.

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THE FACT THAT a physician may not be capable of performing a major surgical operation does not at all prove that he might not be thoroughly competent to follow the operation, to direct it, and even to criticise it. Moreover, in view of the systemic considerations involved, including the preparation of the patient in advance and the postoperative treatment, it is quite conceivable that the patient would be better cared for by a surgeon and a physician than by a physician alone.

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SO LIKEWISE IN BRIDGEWORK. We have two entirely different types of skill required for success. On the one hand the able general

practitioner, capable of determining what is and what is not a proper field for bridgework, and competent to adequately prepare that field for the structure, such preparation including the eradication of all disease and the treatment of abutment roots so as to provide against subsequent disease. Such a practitioner might likewise be entirely competent to plan the type of structure best adapted to his patient's requirements, yet he might be totally incapable of constructing the fixture himself with anything like the perfection of detail and finish of workmanship that might be obtainable from a skilled technician.

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REVERSELY, WE MIGHT conceive—and, indeed, many such do exist—dental technicians who have a thorough grasp of mechanics, but who are endowed with no physiologic, nor pathologic sense whatever.

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IS IT NOT POSSIBLE that much of the failure of bridgework in the past—and, yea, in the present—is due, not so much to faulty principles, but more often to the fact that the practitioner is either skillful as a dentist and unskilled as a technician, or else lacking in operative ability while skilled in mechanics? Or perhaps unskilled in both, but, as Dr. Mauk suggests, unwilling to refer the patient because of his greed for money.

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IF THE TRUTH WERE KNOWN, is it not a fact that the men who combine the maximum of ability in the operative field of bridgework with a similar skill as technicians are rare indeed? I pause here and enumerate them mentally. I can call to mind the names of fifteen real crown and bridgework adepts, and there I am forced to stop and think. Fifteen out of fifty thousand licensed to do the work! There are more, of course, though unknown to me. But how many more?

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MIGHT IT NOT BE that in the future one solution may be found along these coöperative lines? Skilled bridgework technicians doing work under the direction of capable, competent operative dentists? This may be a dream, but it surely is an intriguing vision.

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IN THE EDITORIAL in this issue the question is asked: "Can the Rational Use of Fixed Bridgework be Definitely Determined?" This inquiry is touched upon by Dr. Mauk. Before quoting him, however, let me lead your mind into a groove wherein you will better grasp the potentialities of the problem.

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IN A DISCUSSION recently I phrased it somewhat after this fashion: I once saw a fourteen-unit bridge attached to two cuspid teeth, the

❖ rear ends supported on saddles. Brother Members of this Club, in ❖ view of all that you now know of the dangers from foci of infection, ❖ would you build such a structure? Would you expect two roots ❖ to support thirteen units? Or twelve? Or eleven? Or ten? Or ❖ nine? Or eight? Or seven? Or six? Or five? I stop at this ❖ point because a prominent essayist at the meeting alluded to showed ❖ on the screen a five-unit bridge on two abutments. Dr. Mauk would ❖ limit the load to four units, as we shall see. He writes as follows:

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"WHAT WOULD WE SAY of the engineer who built his long span ❖ bridge on two abutments, knowing from his load and factor of ❖ safety tables that four abutments were needed? Irrelevant, you ❖ say, because the engineer is not limited to abutments already there, ❖ but can build as many as he wants, where he wants them. Not al- ❖ ways—and when he encounters that condition, he does not build a ❖ bridge; he advises a ferry. ❖ ❖

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"IT WOULD BE IMPOSSIBLE to lay down an infallible rule as to how ❖ many pontics may be allowed for each abutment. Too many factors ❖ enter into the calculation to make this practical. As a working basis, ❖ we may say that a limit of one pontic for each abutment cannot be ❖ exceeded without danger of premature loosening and loss of abut- ❖ ments. ❖ ❖

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"YOU WILL OBSERVE that this exactly doubles the work required of ❖ any tooth and its attachments when used as an abutment. It may be ❖ argued that the stress can be distributed in greater proportion upon ❖ the multi-rooted abutments and diverted from the single-rooted. ❖ This may be true in a single position—say that of central occlusion— ❖ but cannot be maintained in a lateral excursion of the mandible."

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IN A DISCUSSION of the underlying principles of bridgework, by a ❖ teacher who plainly believes that there is a place for fixed bridge- ❖ work in dental practice, it would seem that the above statements are ❖ most significant, and, coming from a man as prominent as Dr. Mauk, ❖ these views might well be carefully studied by other teachers as well ❖ as by practitioners. ❖ ❖

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HE TELLS US in language that cannot be misinterpreted that: "As a ❖ working basis, we may say that a limit of one pontic for each abut- ❖ ment cannot be exceeded without danger of premature loosening and ❖ loss of the abutment." This is exactly the argument used by those ❖ that oppose fixed bridgework as a general principle, viz.: that fixation ❖ of teeth presents a danger of premature loosening and loss of the

abutments. These men declare that such danger exists from the moment that two or more teeth are bound together with a bridge. This may be radical, of course, yet here we have Dr. Mauk, an advocate of fixed bridgework, in certain conditions, admitting that this danger of premature loosening and loss of the abutment exists whenever we exceed the ratio of one pontic to each abutment.

AM I WRONG IN ASKING DR. MAUK, if this danger exists when we use three pontics on two abutments, does it not exist, even though in a lessened degree, when we use two pontics with two abutments? Dr. Mauk admits that it is impossible to lay down infallible rules, and then he sets up this limitation of one pontic to one abutment. Evidently, then, this is his extreme, and this limit that he places to the field of fixed bridgework is not founded upon infallible reason or fixed rule, but is merely his conception of a boundary beyond which danger is certain.

CLUB MEMBERS, do you comprehend this? According to this, if your patient has lost a first bicuspid and a first molar, the other teeth and the mouth in general being in a state of perfect health, a fixed bridge is permissible. But if your patient has lost a first bicuspid and the first and second molars, the fixed bridge would then be bad practice if not malpractice. Well, perhaps if fixed bridgework in the future can be confined within this limit, and all who build longer spans were accounted as malpractitioners, much good might accrue—to patients.

THERE IS ONE MORE STATEMENT by Dr. Mauk that merits close study. He points out with forceful argument and potent truth the fact that no style of bridge, fixed or removable, can be successful with faulty occlusion. Let us consider his exact language.

"MANY A BRIDGE which has brought its share of condemnation on the art of Bridge Prosthesis, and caused the premature loss of its abutments, would still be rendering efficient service if even a moderate approach to anatomical occlusion had been secured. How long would a set of closely adjusted transmission gears last in which one tooth was appreciably longer than the others? Just one revolution—either the tooth, the bearings, or the supporting framework would be broken.

"THIS CONDITION IS analogous to that in a bridge having one cusp which occcludes without undue pressure, but which forms the only point in contact during a lateral excursion of the mandible; the supporting structures, not being rigid, yield under this impact, repeated

hundreds of times at each meal, and the abutments and the opposing tooth become loosened, with attendant inflammation.

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"WEAR OF THE high point takes place in time and the symptoms subside. But let us visualize a bridge with a series of inclined planes, which, though occluding without inconvenience, receive all the force of the masticating muscles in articulation. The aggregate of the surfaces involved is too great to wear down readily, and the displacement of abutments goes on daily in a staggering total of impacts. No tissues, no matter how elastic, can resist this action, and a permanent loosening of peridental attachments takes place in permanently enlarged sockets. All the attendant train of evils follows."

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WITH THIS WE ARE entirely in accord. Indeed, a warning note of this kind appeared in this department last month. But why is it that "the displacement of abutments goes on daily in a staggering total of impacts"? Let us study this for a moment. When do these impacts occur? Not, as some might assume, all day long. The mouth at rest is usually the mouth open. The impacts occur during mastication, as Dr. Mauk says. And why is damage done to the abutments, when the impact is from a too-high pontic against the occluding tooth? Dr. Mauk does not tell us that a pontic articulated so that it extends above the normal plane of occlusion, so as to occlude too sharply with its antagonist, will cause injury to the antagonizing tooth, though of course he knows that, and includes this in his statement that "all the attendant train of evils follow." But what he particularly tells us is that the "displacement of the abutments goes on daily, etc." Why? Is it for any other possible reason than that this traumatic occlusion brings transmitted and undue stress upon the abutments to which the pontics are fixed?

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IF THIS INJURY to the abutments can occur when the occlusion is faulty, because of the impacts during mastication, is it not true in only a somewhat lessened degree when the occlusion of the pontics is correct? We have seen that the trauma is transmitted during functional use. In the effort to masticate hard foods the too-long cusp strikes its natural antagonists a staggering blow, and these transmit back again a stress which passes through the unyielding metal of the fixed bridge, causing a strain which reaches the abutments, and, as Dr. Mauk says: "No tissues, no matter how elastic, can resist this action, and a permanent loosening of the peridental attachments takes place in permanently enlarged sockets."

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IF DR. MAUK HAS THIS ACCURATE VISION of what occurs when the cusp of a pontic is too long, is it not equally evident to him that even when the occlusion of the fixed bridge is perfect, we have the same sequence of destructive events whenever hard food is interposed? Is it not plain that a crust, or hard candy will do the same damage as a high cusp? Is it not likewise true that in normal mastication the cusps are always momentarily too high? Brother, test this at once. Imagine yourself chewing a bit of meat. Slide your mandible sideways so that the cusps of your molars and bicuspids occlude as in the first stage of chewing. The rest of your mouth is open, is it not? All your muscular force is exerted on those cusps, is it not? And if you had a fixed bridge in one jaw this force would be exerted against the abutments, even though no part of the food were in contact with the abutments, would it not?

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AND NOW WE HAVE one more argument along these same lines, against fixed bridgework, which is herewith presented because this argument, strange to say, occurs in a plea in favor of fixed bridgework. The facts are as follows: Dr. Hart Goslee was recently preparing a paper on this subject, and he presented the question to Dr. Calvin S. Case, asking for his views upon the physiology and possible pathology of fixed bridgework. I have a copy of Dr. Case's reply, and would be most happy to present it in full, but as Dr. Goslee read this letter as a supplement to his paper before the Chicago Dental Society, and as both are to be published in the Journal of the National Dental Association, I do not feel privileged to publish it here. I do trust, however, that I am not transgressing journalistic ethics in making the following quotation, which I do because, while presented by Dr. Case in a communication supporting the theory of fixed bridgework, his knowledge of the occlusal forces and the powers exerted by leverages caused him to present what seems to me to be a powerful argument against fixed bridges. After giving his reasons why he thinks that fixed bridgework is permissible within proper limitations, Dr. Case has this to say:

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"IF IT IS TRUE that no dental fixture can stop the normal root movement of mastication, it is certainly the most important consideration relative to fixed bridge dentures, because any character of attachment which rigidly binds one tooth to another, that is more or less distantly located from it, is bound to come under the unequal forceful strains of masticating movements which so frequently loosen and break down the most skilfully constructed fixtures, or produce other conditions equally disastrous.

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"IF THE PIERS of a two-pier buccal bridge are close to each other, as in cases where a single artificial biscuspid is required, there is lessened danger, because of the probability of a more equal distribution of the masticating force. Nevertheless, if one of these piers has a devitalized pulp with hypertrophied pericemental tissues, etc., the slight difference in its repeated and forceful movements must in time result in disaster to a very large proportion of even these simple bridges.

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"IF THE FORCES OF MASTICATION were always up and down, or along the line of the axes of parallel roots that were equally solid in their sockets, and with an even distribution of force, there would be little danger to fixed bridge dentures, however distant the piers are from each other. But, unfortunately, this rarely obtains.

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"THE FACT THAT EVERY ATTACHMENT of a fixed bridge to its pier is immovably constructed means that in any inequality of the applied forces of mastication upon one side of the mouth or the other, or upon the molar piers in relation to the front ones, the entire bridge structure, even to the very apical ends of the roots, must move in exact mechanical coördination as if it were one solid piece, whatever the unevenness of the strains.

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"THEREFORE, IF THE MOLAR END of a fixed bridge upon one side is permitted and is forced to move in a certain direction, and the adjoining cuspid pier, upon which the same masticating force is not applied, is prevented from taking exactly the same relative movement, because of the length, direction or solidity of its socket attachments, etc., the inequality of the repeated strains upon the attachments must in time disrupt the most substantially constructed fittings."

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DR. CASE THEN amplified these remarks with a logical discussion of the laws of leverage, with illustrations to clarify his argument. We hope that when published, this communication from Dr. Case will be carefully studied by those that believe that fixed bridgework is permissible in the human mouth. The passages quoted seem to be powerful arguments against the fixation of teeth, even though occurring in a letter from a gentleman who believes that fixed bridgework has a place in dentistry. Certainly, in view of the dangers against which Dr. Case warns us, this place must be small indeed. 1919.

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XXXVIII.

A MEMBER OF THE CLUB sent in a query recently, reciting his troubles with putrescent teeth, and as his problem may be the problem of others as well, we have obtained the opinions of a few of the experts, and they will be herewith set forth.

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THE COMMUNICATION read as follows: "Patient presents with a tooth containing a putrescent pulp, face swollen and tooth very painful to touch. At first sitting I open into the canal, absorb as much moisture out of the canal as is possible without disturbing contents, and seal in a dressing of tricresol and formalin, expecting at the following sitting to be able to adjust the rubber dam and thoroughly cleanse the canal with sulphuric acid. But on the following day the patient generally calls up and tells me that the tooth is just as as sore; can't be touched; and after waiting another day invariably has the tooth extracted.

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"IN MANY OF THESE CASES, while the swelling has subsided, still the pain remains so intense that it would be impossible to enter the canal to thoroughly cleanse it. Only the other day such a case presented; but, instead of sealing in a treatment of tricresol and formalin, I adjusted the rubber dam and cleaned the canal with sulphuric acid, forcing a little into the periapical area; then used bicarbonate of soda, etc. But since Saturday that patient has been in misery and is still suffering. How would you proceed in these cases? My first aim always is to alleviate the pain, but I must admit that I seldom succeed in doing that."

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RADIOGRAPHS IN THESE conditions have in his cases shown extraction to be unnecessary. The first reply comes from Dr. M. L. Rhein, and reads as follows:

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"I AM UNDER THE IMPRESSION that the failure with the application of tricresol and formalin is due to the technique of the operator. It is possible, that in attempting to absorb all the moisture from the pulp chamber after opening up the tooth, the operator has forced, by pressure, some infection through the foramen; or, it may be that

❖ he has placed his dressing in the root canals, which is always wrong. ❖ The case as described, is an ideal one for the application of tricresol ❖ and formalin, but in utilizing this therapy a pledget of cotton soaked ❖ with the remedies should be loosely placed in the pulp chamber, ❖ without any more operative interference than is absolutely necessary. ❖ This should now be sealed in the cavity with a good cement, and ❖ left for at least a week. He writes that the patient complains of the ❖ tooth being just as sore on the following day. It sometimes takes ❖ forty-eight hours for the soreness to entirely leave the tooth. I ❖ have never known of a failure of this treatment when used in this ❖ manner. Frequently I have left such a tooth for two or three weeks, ❖ and found the remnants of the pulp to be all shriveled up upon ❖ opening the tooth. ❖ ❖

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"IF MY DIAGNOSIS indicates that infection to any considerable degree ❖ has reached the periapical region, it is possible that this treatment ❖ would be inadequate. For this, and other reasons, I never utilize ❖ this treatment except in cases where there is insufficient time to ❖ operate immediately upon the pulp tissue. When it is possible to ❖ obtain sufficient time to thoroughly remove the canal contents, no ❖ delay should take place, as the sooner all such pulp tissue is re- ❖ moved, the less damage will be done to the periapical region. A ❖ pulp of this kind must be removed with as little pressure as pos- ❖ sible, in order to avoid the forcing of infected portions through the ❖ foramen. For this reason also, sulphuric acid should never be used, ❖ as the use of this agent will not preclude such a disaster. There is ❖ only one therapeutic agent that I know of that can be used in such ❖ a tooth without the slightest fear of any infected material either ❖ being left in the canal, or being forced through the foramen. This ❖ material is best known as the Schreier Paste, composed of a mixture ❖ of sodium and potassium. The rationale of the difference between ❖ these two agents consists in the fact that sulphuric acid is a natural ❖ caustic, and, by virtue of its irritating properties, bores its way ❖ through different media, and when this action is completed, there ❖ is always left behind a precipitate which cannot be absorbed. This ❖ accounts for the bad results obtained where sulphuric acid has been ❖ forced into the periapical area. ❖ ❖

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"AFTER THE RUBBER DAM is adjusted and all ordinary measures for ❖ asepsis are observed, the following procedure will invariably meet ❖ with success: ❖ ❖

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"THE PULP TISSUE is removed from the pulp chamber, and perhaps a ❖ small part of the canal. On the tip of a proper instrument a piece

of sodium and potassium about the size of a pin-head is applied to the pulp tissue. This is followed by repeated applications, never using more than this at a given time. The applications are continued until every particle of the pulp tissue has been destroyed, and there need be no fear about the sodium and potassium passing through the foramen. The destruction of the pulp material by this means is accomplished by the intense heat created by the combination of organic tissue with the sodium and potassium. Its action in destroying the pulp can only be compared with that of the actual cautery. When the action of this agent is completed, whatever residue may be left is readily absorbable, so that there never is a precipitate in the periapical region which cannot be taken care of, as is always the case when any organic acid is used. Any subsequent inflammation is generally controlled by electrolytic treatments of sulphate of magnesia."

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OUR NEXT CONTRIBUTOR is Dr. Elmer S. Best, of Minneapolis, who writes thus: "Replying to yours, would say that your correspondent has a real difficulty in trying to save such teeth. The fact that the face is swollen is, of course, an indication that the trouble is no longer confined to the root canal, and in my opinion is beyond control by means of medication through the canal. In view of the after results in saving such teeth, as a general practice it is just as well that the patient continue to suffer pain until the tooth is extracted, as he is thereby saved what might easily happen to him, viz.: The changing of an acute infection into a chronic focal infection. The statement 'Radiographs in these conditions have in his cases shown extraction to be unnecessary,' is to my mind misleading, and tends to an unbalanced diagnosis. Clinical evidence in these cases is just as valuable as radiographic evidence and must not be omitted.

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"TO EPITOMIZE the above, the patient's welfare demands that the safest possible method of removing apical infection be employed, and this is by surgical means. This does not, however, mean that all pulpless teeth are infected."

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DR. ARTHUR B. CRANE, of Washington, D. C., replies as follows: "The question is more difficult to answer, because of the 'ghosts' of past failures in my own attempts to control similar conditions. I think perhaps the difficulty with many of us is that we are obsessed with the idea that we are going to 'cure' something; whereas, if we get down to first principles and study Nature a little, we will find, in most cases, that the best we can do is to hasten along the natural processes. And we will often find, too, that the line of treatment

which will be most effective is indicated by the clinical manifestations.

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"IN THESE PARTICULAR CASES, the swelling of the face indicates the need for drainage, and the soreness of the tooth the need for physiological rest. To begin with, the pain can be temporarily controlled by means of conduction anesthesia. This also aids in the thorough accomplishment of the operations about to be suggested.

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"DRAINAGE MAY AND SHOULD BE OBTAINED in two directions; first, the canal should be opened as freely as possible, preferably by the sodium and potassium method. It will often be possible to drain off small quantities of pus in this manner. It is doubtful if a tooth in this condition should be tightly sealed up, but a loose pledget of cotton saturated with any antiseptic oil may be placed in the pulp chamber and covered with temporary stopping. This filling should then be punctured in several places to give vent to any gases which may subsequently form in the canal. I know the old bugaboo about saliva reinfecting the canal, but that is the object of placing the oil-soaked cotton in the pulp chamber. There is no notion that this treatment will be of any decided antiseptic value in the canal.

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"THE NEXT STEP is to establish drainage directly through the tissues. The recognition of the value of this expedient dates back to Hippocrates at least, and it is Nature's own method of fighting pyogenic infection; yet how few dentists make use of it until Nature has so far completed the job that the pus is just about to break through anyhow. If pus is not found by cutting through the mucoperiosteum, then a window must be cut through the alveolar plate, and several punctures should be made through the cancellous bone to the root apex.

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"PHYSIOLOGICAL REST for the tooth can often be obtained by judicious cusp grinding. Where this would be detrimental, the occlusal surfaces of a couple of teeth may be dried and copper cement flowed over them in sufficient thickness to prevent occlusion on the sore tooth. Further rest may be obtained by carefully ligating the tooth to the adjoining tooth on either side.

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"THE HOME TREATMENT should consist of the application of a thick, hot plaster of antiphlogistin, covering the whole swollen area, the plaster in turn being covered with several thicknesses of absorbent cotton, and bandaged on for several hours. A few five-grain doses of aspirin will usually relieve the pain sufficiently to permit sleep,

and in the morning most of the severe symptoms should have vanished.

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"AS ACUTE ALVEOLAR ABSCESS may be, and often is, superimposed upon advanced dental granuloma, or dental cyst, a radiograph should be made and studied before anything is undertaken. Thus we may happily be led to extract the tooth, and thereby avoid future complications."

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DR. DAVID WIELD McLEAN sends us the following contribution: "The first thing that strikes me about the communication is that it is a satisfaction to find one more man who has courage to treat an infected tooth, and also to admit doing so. I had come to believe that there were only two or three of us doing that; and after reading some of the recent papers on the subject, have personally felt so guilty that every time the bell has rung I have expected to find the Sheriff at the door, come to put an end to my career of crime.

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"THE PUTRESCENT CANAL in the absence of acute periapical abscess, we treat as follows:

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"IF THE TOOTH is not too sensitive to the touch, the cavity is thoroughly excavated as far as caries is concerned; fillings adjoining the cavity are removed, and the canals opened, care being used not to plunge a Gates-Glidden, or other drill into the canal, as pressure upon the semi-solid contents would result in the extrusion of infected material through the foramen. I usually open the putrescent canal with a small Gates-Glidden drill, then cutting backward (i.e., with a withdrawing motion) until the orifice is large enough to accommodate the next size drill, etc. Tooth and canals are thoroughly dried and two or three drops of phenol-iodid (saturate solution iodin crystals in phenol, giving an iodin solution of somewhere between 60 and 80%) are carried to the floor of the chamber and allowed to work their way into the canals as far as they are opened. The excess is then removed and a pledget of cotton saturated with formo-cresol is placed in the chamber and sealed with very hot gutta-percha, great care being taken to avoid exerting pressure. Pressure in condensing gutta-percha would press a certain amount of medicament out of the cotton and force it into the canal, in turn forcing infected material through the foramen.

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"THE PATIENT is instructed to remove the gutta-percha in the event of trouble, sealing the tooth with plain cotton, and telephoning the office at the earliest possible moment. When seen, we dress again in the

❖ same manner, but seal the cavity with cotton and sandarac. I know
❖ the objection has been made that the sandarac will permit infection
❖ to get into the tooth, but in my opinion infection that can get into
❖ the tooth at this stage is insignificant compared with that which is
❖ already there. ❖ ❖

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"WHEN THE SANDARAC DRESSING is resorted to, to permit the
❖ escape of mephitic gases, the tooth is re-dressed at three-day intervals
❖ two or three times after pain has ceased, before gutta-percha is again
❖ used. In no case, whether the sandarac dressing becomes necessary
❖ or not, do we attempt to reach the apex until the third or fourth
❖ treatment. At each appointment we ream a little farther toward
❖ the apex and insert another dressing to sterilize the territory just
❖ ahead. ❖ ❖

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"WHEN THE PUTRESCENT canal is accompanied by acute periapical
❖ abscess such as the Doctor described in his letter, our dressing of
❖ phenol-iodid in the canal, and formo-cresol in the chamber, is sealed
❖ in with cotton and sandarac until the acute symptoms have disap-
❖ peared. As the periapical abscess, after its inception, is a thing apart
❖ from the root canal and may have to run its course, even after the
❖ canal is sterilized, we resort to other measures in addition to the root
❖ canal treatment. Purgatives are prescribed; anodynes, if necessary.
❖ The entire area of the face is covered with hot antiphlogistin, or a
❖ poultice of hot raisins is applied to the gum, or the lance is resorted
❖ to, according to the stage and degree of the abscess. If the lance is
❖ used, a seton is always inserted until suppuration has ceased, and the
❖ canal is reamed at once and sealed with gutta-percha. After the
❖ first two or three treatments, phenol-iodid is discontinued and the
❖ formo-cresol used until the canal is ready for filling. ❖ ❖

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"THERE IS A TENDENCY on the part of a great many operators to
❖ ascribe pain which may develop after the first or second treatment
❖ of a putrescent root canal with formo-cresol, to the drug—especially
❖ in cases in which there had been little or no pain prior to the open-
❖ ing of the canal. After testing various medicaments, in different ro-
❖ tation, I have become convinced that the pain is due to the infection
❖ and to the inflammatory reaction of the tissues. Indeed, all of the
❖ older men will recall getting the same reaction before formo-cresol
❖ was ever heard of. An infection which, in the absence of oxygen,
❖ has been dormant for several years, may become exceedingly active
❖ after mechanical 'stirring up' by instrumentation, or the admission
❖ of oxygen to the nidus. ❖ ❖

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"IT IS NOT SURPRISING that the immediate treatment of the canal with sulphuric acid, or phenol-sulphonic, such as the Doctor described, should result in pain and trouble. Any one who will ream the canal of an extracted tooth, enlarge the foramen, pump the canal full of sulphuric acid, as he would in the mouth, and then neutralize with bicarbonate solution, will be interested in seeing the manner in which the solution boils out through the apical foramen, carrying debris from the canal with it." 1920.

COMMENT. In preparing the above for present publication I am constrained to declare that I am in accord with the treatment outlined by Dr. Rhein. In conditions such as described by our Correspondent, the statement being that the tooth harbors a putrescent pulp, and that the face is swollen, I believe that there is no reason to temporize.

THERE SEEMS TO ME to be an unfounded fear on the part of many operators, least they force infected material through the foramen and thus produce an apical infection. This is a sound doctrine in appropriate cases. Let us suppose that an effort is made to preserve a living pulp by capping. The patient returns in twenty-four hours with a report that the tooth is sore; tender to the touch. The pulp has died, but the operator concludes that while there may be a pericementitis present, it is as yet only an inflammatory lesion without actual apical infection. In such cases, having removed the capping to verify the suspicion that the pulp has died, it might be safer, at times, to apply a formo-cresol dressing, until the following day. But even in these cases, if at all possible I prefer to essay pulp removal with careful, gentle, instrumentation.

BUT WITH A PUTRESCENT pulp, and a swollen face, the infection has evidently passed through the foramen already. It would seem to me safer to remove the putrescent pulp, even though there be a risk of forcing some infected material beyond the foramen. As this is necessarily infected with the same organisms that are already disturbing the apical region, little harm can be done. It would seem wiser to remove the putrescent pulp and attempt to destroy the organisms at the apex, rather than to undertake to sterilize the infected pulp. Schreier's sodium and potassium is the ideal remedy for this purpose. 1928.

XXXIX.

AT THE LAST MEETING of the Dental Society of the State of New York one of the essayists declared that any dentist who inserted a gold inlay "when an amalgam filling would do as well" committed a crime. This aroused a strenuous discussion, and eventually, a resolution was passed eliminating the statement from the paper before publication.

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THE SUBJECT is well worth discussing, and may be considered together with the query propounded to the club some months ago by Dr. Kells, who asked: "What shall we think of a man who removes perfectly good amalgam fillings just to make room for gold inlays?" Those are not the exact words, but they contain the gist of Dr. Kells's postulate.

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THIS LATTER QUESTION has been before the club for some time and no one has offered any reply. Let us therefore discuss it first. Naturally if the amalgam filling "is perfectly good" the man who removes it merely in order to replace it with a gold inlay is either a fool, a fanatic, or a faker.

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BUT THEN, A FAIR INQUIRY would be "when is an amalgam filling perfectly good?" To be "perfectly good," an amalgam filling must have been in place long enough for one to be sure that it is preventing recurrence of decay. It must be an "occlusal restoration" (if in the masticating surface) as well as a filling. Such fillings are rare indeed.

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THEN AGAIN, many operators believe, and there is much argument in favor of the contention, that the only positive safeguard against recurrence of decay is oxyphosphate cement; meaning, of course, cement protected from wear by a metallic filling, either a cast gold inlay or amalgam. Such a man, finding an amalgam filling which had not been placed into a cement lined cavity, could with perfect conscientiousness, remove a filling in which he has no faith, to replace it with one which he knows to be more reliable.

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WHERE THE AMALGAM filling is otherwise apparently good but has a flat surface, the conscientious dentist may do much for his patient's comfort and masticating efficiency by carefully carving and polishing the previously "flat" filling.

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IN A CASE RECENTLY treated at the request of an orthodontist who found several flat occlusal surface fillings which hindered the success of his correction of the malocclusion, imperfectly formed gold fillings were removed and replaced with gold inlays, whereas a large amalgam filling was carved into a very effective reproduction of the normal tooth on the opposite side of the mouth.

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HENCE THE "PERFECTLY GOOD AMALGAM FILLING" may, and should be, left in place. But a "perfectly good dentist," on the other hand, has a right to decide as to the "perfect goodness" of amalgam fillings. It is possible to err on the wrong side of conservatism.

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FOR EXAMPLE: In another case recently treated, all new cavities had been filled when the patient inquired as to three amalgam fillings. They were not "perfectly good amalgam fillings," but they had been set down as "good enough amalgam fillings." They were of good shape, the edges were unbroken, and seemingly they were doing good service. The only possible objection that could be made to them was a slight, a very slight bluishness about them. Whether this meant decay around the fillings, or just an oxidation of the dentin from one of the ingredients of the alloy, was a question about which one man's opinion would be as good as another's.

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AFTER A FRANK DISCUSSION of the possibilities with the patient, the patient himself suggested that one be removed for a thorough examination. This was done and a very considerable and dangerously deep layer of decay was found under the filling. The two others when removed were found in the same state. A slow caries was in progress, and there is no doubt that eventually the pulps would have succumbed, just as many a pulp has died under fillings which dentists leave in under a false notion of being conservative, or through fear of being accused of condemning the work of a colleague.

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THE QUESTION THEN of the removal of amalgam fillings for replacement with gold inlays, is one that cannot be determined by rule of thumb, but must be decided in each case by the dentist attending. There is very little doubt, however, that a dentist is erring on the right side, if he errs at all, when he removes amalgam fillings which

show discoloration of the adjacent dentin. Such condition never prevails where cement had been placed between the metal and the tooth and in the absence of the cement lining there is an even chance that the discoloration will prove to be decay.

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THIS, THEN, BRINGS us to the other question. Does a dentist commit a crime if he inserts a gold inlay when "amalgam would serve as well?" Evidently the proponent meant to convey the idea that the choice of a gold inlay, if choice were made, would be because of the greater fee that could be charged. Yet this is not always the case. Undoubtedly a small accessible cavity can be more easily and hence more cheaply filled with amalgam. But there are conceivable situations where a gold inlay would be both cheaper and less strain upon the patient, than the insertion of an amalgam filling "that would serve as well." Let us cite an extreme case, in order to emphasize a moral.

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LET US SUPPOSE that a patient presents with a mesial approximal-occlusal cavity in the lower second molar, and a similar cavity in the distal surface of the lower first molar. These cavities can be filled with gold inlays that restore the masticating surfaces and have perfect approximal contacts, without separation of the teeth, and with practically no unusual stress upon the patient. This can be easily done in three sittings. A pattern may be made for one inlay at the first sitting; the inlay for this cavity may be set, and a pattern for the other cavity made at the next appointment and the final insertion of the second inlay at the third.

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TO MAKE AMALGAM fillings that would serve as well, it becomes necessary to separate the teeth to a considerable distance, to prepare one cavity, make a properly contoured matrix, and insert the amalgam. Even with quick setting amalgams, the occlusal carving is only "blocked in," so to speak, and a final carving and polishing is necessary at the second sitting. If the matrix is not left in place the patient often returns with part of the amalgam missing, and the work must be done over. This filling, after the removal of the matrix, must be properly polished, and not infrequently, in spite of all care with the application of the matrix, a considerable overplus of amalgam will have been pressed down against the gingival tissues, and the proper removal and perfect polishing is not only difficult, but damaging to the gum septum. This work must now be done again with the second tooth, great care being observed to assure us that the space obtained will be sufficient for an overbuilding which will

permit of polishing the approximal surface without leaving a permanent space.

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THE INSERTION OF SUCH amalgam fillings in approximal cavities requires more time and more skill than the insertion of equally good gold inlays. Moreover, the operator who can make such amalgam fillings would charge a higher fee than for inlays.

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AN APPROXIMAL-OCCLUSAL CAVITY filled with amalgam, with less care than above outlined, will never result in a filling that will "serve as well" as a gold inlay.

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IT CANNOT THEN be dogmatically declared a crime to insert a gold inlay where "amalgam would serve as well," because it is difficult to know that the amalgam would serve as well. Indeed, there are comparatively few places where it would.

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BUT THERE ARE PLACES where amalgam will serve better than gold in any form for the simple reason that a perfect gold filling could not be made. In such cases, of course, amalgam should be used. But there is another dogma that might be erected, which will fit many more cases in practice, and we present it without comment or discussion.

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IT IS MALPRACTICE to insert an amalgam filling where a gold inlay would serve better!

1920.

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XL.

IT WOULD DO US GOOD, or at least some of us, if we could but know just what other folks in town think of us. I had been over to Brooklyn one night recently, listening to a very learned dissertation on one of the latest phases of scientific dentistry, and was coming home, via the subway, feeling rather "sot up," as they say in New England, when I chanced to overhear a few of the "Plain People" talking about dentistry.

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BE IT KNOWN that from Brooklyn to Upper Broadway, Manhattan, is a fairly long ride. Hence the passengers settle down to be as "cumfy" as possible and "visit." Immediately next to me sat three women, their escorts standing in front of them and discussing the pros and cons of the income tax, increasing rents and decreasing incomes, so that the women were left to make conversation for themselves.

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"OH, MAGGIE!" said one, "you remember that dentist you recommended to me? Dr. Savage, you know. Well, say, 'savage' is right. Gee! An' I thought you were a friend of mine."

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"WHAT YOU BEEFING ABOUT NOW?" asked Maggie. "What's Dr. Savage done to you?" "Not a thing," snapped her friend in reply. "Not one little thing in the world. He an't done anything to me, but believe me, he done me, and done me good. I'll say so! You know my little sister, Alice? Well, I took her to Dr. Savage because her front teeth reached your eyes before the rest of her face, if you know what I mean. This Savage person, or dentist, if you want to call him that, said he would fix them for two hundred. Not cents, you know, plain every-day American dollars; or, 'Liberty Bonds taken here'—get me? Well, he worked a year on that innocent child, collected his little bill and then what do you think? Six months after the work was completed—or, rather, I should say, after the bill was paid—her teeth were just about as conspicuous to the party of the second part as they were before we started. So in the end I had to take her to an orthodontist."

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"AN'T THAT ALWAYS the way?" said the third woman, name not

❖ mentioned. "Never mind what dentist you start with you have to
❖ go to another dentist to get finished. And say, an't that other
❖ dentist frank about that first man's work. Did you ever notice?"

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"BE THAT AS IT MAY," said the one they called Maggie, shifting the
❖ discussion a little away from her own dentist, Dr. Savage, "have you
❖ heard the latest riddle about dentists? It goes like this: 'What is
❖ the difference between a dentist and a doctor?' ❖ ❖

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"I THOUGHT a dentist was a doctor," retorted the first combatant. ❖

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"YOU'VE GOT MOST of the dentists with you at that," said Maggie.
❖ "That's what they all think. But listen to the answer. A dentist
❖ tries to save all your teeth so that you can keep well, and the doctor
❖ tells you to take out all your teeth so you can get well. See?" ❖

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"BUT AN'T THAT STUPID?" said woman number three. "If they
❖ take out most of your teeth, how are you going to chew your food?"
❖ "Oh! We won't cross that bridge till we get to it," said Maggie.
❖ "And, say, never mind what sort of pains you got, if your doctor
❖ looks in your mouth and sees a bridge! Well, it's all off. The
❖ bridge, I mean, and that's the answer." ❖ ❖

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"GLORY!" said the original conversationalist. "It must be terrible to
❖ know so much as these up-to-date dentists and doctors. But, com-
❖ ing back to the orthodontist, you didn't quite get me, Sally. What
❖ I meant was——" But here the guard called: "Penn. Station!"
❖ and the party left the train. ❖ ❖

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BUT THOSE LAST WORDS of hers started a new train of thought.
❖ "Coming back to the orthodontist." It has been argued that ortho-
❖ dontia should be practiced as a separate specialty, rather than by a
❖ general practitioner. But there is a good reason for this which I
❖ have never seen advanced. ❖ ❖

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THE ORTHODONTIST receives a patient, "cures" the case, and receives
❖ his fee. There ends the story. There is no "coming back to the
❖ orthodontist." New consultations, and study models, etc., etc., mean
❖ new estimates, new treatment and new fees. And the orthodontist's
❖ fees? Well, ——! ❖ ❖

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BUT WHEN THE GENERAL practitioner undertakes to correct a slight
❖ malocclusion, after he has "cured" the case, and collected the fee,

❖ etc., etc., the patient keeps "coming back to the dentist" for pro-
❖ phylaxis, fillings, etc., etc. So the dentist has a chance to observe
❖ the second permanent molars coming in, and the upper central in-
❖ cisors coming out again, and the laterals turning around to look at
❖ the centrals, and the bicuspids leaning across the arch to chat with
❖ their friends on the other side, and the four lower incisors crowd-
❖ ing together like the deacons after service counting the offering, etc.,
❖ etc. Well, ——!!! ❖ ❖

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IN CLOSING THIS painful subject I have but a word more to say.
❖ Much has been said, and much has been written, about the etiology
❖ of malocclusion. But if you really want to know how teeth that
❖ are in good alignment gradually move into malocclusion, permit me
❖ to refer you to some conscientious, general practitoiner, who has
❖ tried to practice orthodontia for patients who keep "coming back"
❖ for regular dentistry. If he has been a good observer, he should
❖ have a wealth of knowledge on the subject. ❖ ❖

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YES! BY ALL MEANS! If you decide to practice orthodontia, prac-
❖ tice it as a separate specialty. It is so much more peaceable.
❖ A-h-h-men! 1920.

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XLI.

IN BEGINNING THIS NEW VOLUME it has seemed only fair to look carefully through the Club's Letter Box to see if any communications therein have suffered by delay in publication, and to remedy the seeming neglect by printing at once. Perhaps the most important correspondence which I find deals with the subject of bleaching teeth, and it is only just to the various contributors to state that the letters are dated 1915. But as old as they seem to be they will carry new knowledge to many, and, moreover, if anything has been written on this subject in the intervening years, it has escaped my notice. Perhaps also their publication may stimulate some discussion of the subject and bring forth some newer or better methods.

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THE FIRST LETTER was one of inquiry, written by Dr. William B. Brewster of Waterbury, Conn., and reads as follows:

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"I AM TAKING THE LIBERTY of writing to you regarding a case of tooth bleaching which has been giving me a good deal of trouble. A lady presented with a left upper central incisor, having a medium sized gold filling on the mesial aspect, of eight or ten years' standing, which shows signs of leaking. The tooth had been growing darker for the last five years, and when I was allowed to open it from the lingual side, I found a putrescent condition and practically no pulp tissue present. We have overcome the putrescent condition, and have been using sulphuric acid to open the dental tubules, before using sodium dioxid to bleach out the discoloration, and have cut the inside of the tooth nearly as much as I dare. The sodium dioxid is active, as, placed in a test tube and moistened, enough oxygen is given off to make a glowing match stick glow brighter. The use of the dioxid has occurred seven times with very slight effect. Is there any other better bleaching method? Is there a possibility of ever getting that five-year-old stain out?"

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A COPY OF THE ABOVE was sent to two or three men, together with the following written by myself:

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"THE ENCLOSED, from a dentist in trouble, presents a problem which really has not been discussed very much in recent years. Of course, I know it is a big subject, and that a good deal depends upon the nature of the stain, but I would like your present views as to the most efficient method to be employed in bleaching teeth, and you may confine your remarks to teeth in which the stain is due entirely to the decomposition of the pulp. In young children we frequently have teeth which suffer pulp destruction from a blow, and the patient's parents doubt the dentist's diagnosis that the pulp should be removed, and they insist on delay. Some months later, however, they come in with the tooth so discolored that there is no longer any doubt in the matter. Then, of course, they cry aloud for a dentist to bleach the tooth.

"WHEN I FIRST came into dentistry the method of bleaching then in vogue was the utilization of chlorid of lime and acetic acid. I must admit that I have had more success with this than with any other method that has been suggested, but as I said at the outset, nothing has been written on this subject in the last five or ten years, and I would be very much indebted if you would let me have your views on this very important subject."

THE FOLLOWING reply was received from Dr. J. P. Buckley: "Your letter with enclosure received. From the text of the enclosure, I would judge that Dr. Brewster has followed the method outlined in my book in the use of sodium dioxid. If he is working through a lingual cavity, he will succeed far better if he follows the outline given under 'Caustic Pyrozone.' This method will successfully bleach any tooth that is capable of being bleached. There are many factors which enter into the problem of tooth bleaching, and these must be known and understood in advance in order to determine whether the tooth in question is capable of being bleached."

THE FOLLOWING REPLY was received from Dr. Herman Prinz. It will be noted that he suggests a new drug for bleaching, and partially promises to work out the detail of treatment later. Up to date he appears to have neglected to do so. He writes:

"REFERRING TO YOUR KIND NOTE of October 1st and inclosure, let me say that I would suggest the use of perhydrol as a bleaching agent. In my book on 'Materia Medica and Therapeutics,' page 110, you will find some information on this drug. Merck & Company of New York supply it. Regarding the present method of bleaching, the process may be readily improved. The solution is

found in the ready oxydition of the coloring substance by a powerful oxygen carrying agent in the presence of light. This latter factor is most essential; however the use of concenterated actinic rays materially assists the process. At a future date I may find time to work out the details."

AT ABOUT THIS SAME PERIOD it happened that I had some correspondence on this subject with Dr. C. Frank Bliven, and I present one of his letters:

"YEARS AGO I used the lime method, also chlorin gas. These methods bleached teeth beautifully, but destroyed their structure, much to my sorrow and regret. For a number of years I have been using pyrozone and ammonia for this purpose with a fair degree of success, and it is the best method known to me at present. I have tried bleaching with the high frequency current once or twice, but have not had the success obtained by the other method. Possibly there was something wrong with the technique or the materials used. I have been informed that excellent success has been obtained by this method. After the usual preparation, 25 per cent. pyrozone is placed in the cavity of the tooth and the high frequency current is applied. If you wish to see what this current will do to a tooth, put a broach into one that has the pulp canal cleared and apply the current. I have been using this current recently for sterilizing with excellent success so far.

"USING THE PYROZONE AND AMMONIA TECHNIQUE the tooth is first filled about one-third from the apex, preferably with gutta-percha, or with gutta-percha placed over any material used at the apex. The remaining cavity is thoroughly washed with chloroform and thoroughly dried with warm air. A pledget of absorbent cotton saturated with pyrozone is placed in the cavity so as to fill it about half or two-thirds full. Saturate another piece of cotton with aqua ammonia and fill the remainder of the cavity, placing a piece of unvulcanized rubber over the opening and confine the effervescing that takes place within the cavity if you can. After the effervescing has ceased, repeat the operation until the desired result is obtained.

"IN PLACE OF THE 25 per cent. pyrozone solution a tablespoonful of the usual 3 per cent. may be boiled down to about half a thimbleful and used in its place. I find this more convenient, and possibly the results are equally as good. If you wish to repeat the operation fill the cavity with zinc chlorid saturated with pyrozone and seal it carefully and thoroughly with calxine."

DURING THE PAST AUTUMN, 1920, I was endeavoring to bleach a tooth using 25 per cent. pyrozone electrolytically, and had made but little progress in two applications, when the patient called one morning and I found that my last tube of pyrozone had become broken. In this dilemma I undertook an experiment which resulted so beautifully that it is worth mentioning, though I have not had sufficient experience with it since to claim special efficiency for the method as a general proposition.

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THE OLD METHOD, mentioned in my letter to Drs. Buckley and Prinz, involved the use of chlorid of lime and acetic acid. In treating a tooth, as much discolored dentin is removed as possible without weakening the crown, and the cavity is packed with fresh chlorid of lime. As this preparation deliquesces very rapidly upon exposure to the air, it should be kept tightly sealed. An absolutely freshly opened package will give beter results than one that has been opened and kept in the office two or three weeks. The cavity having been packed with the lime, a pledget of cotton saturated with acetic acid is placed in the cavity, the action of the acid liberating chlorin, which is depended upon to accomplish the bleaching. This is usually efficacious except in stains caused by metallic oxids.

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IN THE CASE ABOVE REFERRED TO, as I had previously been using electrolysis, when I found myself deprived of the pyrozone, I proceeded with the lime and acetic method, but added electrolysis. My hope was that I might electrolytically cause the nascent chlorin to penetrate more deeply into the tissues. Whether I did this or not I am not learned enough to say. But my result was better than any I have ever had before. And I have been similarly successful twice since. 1921.

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XLII.

ON THE FIFTEENTH OF JULY, having closed my office for the summer, I decided to go off alone into the wilderness and just commune with Nature and be entirely free of all thought of either the theory or the practice of dentistry. So I boarded a train and sped away to the White Mountains, stopping over night at Bretton Woods, but resuming my journey on the early morning train to the Summit of Mount Washington.

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AT THIS SPOT, which is the highest point, except one, east of the Rockies, the visitor finds himself a thousand feet above tree-line and often even above the clouds themselves. On clear days the view is a grand one indeed, but in this respect the mountain is much like the mind. When all is cloudy there can be no clear vision.

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AND SO I HAD MADE THE ASCENT with a mind that was cloudy indeed, and then as the cog-train crawled higher and higher up the slopes, it was indeed discouraging to see the fog and clouds rolling in, until, when at last we stepped from the train and went into the little hotel room, the windows were like opaque glass so thick was the haze without.

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BUT PRESENTLY I HEARD a pleasant voice calling me by name, and there cuddling by the fireplace was one of our oldest and most respected dentists, albeit he has retired from practice. And so we sat together there in the inglenook and talked—talked shop. Shop, of course! What else could we talk about?

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THERE IS AN OLD RIDDLE which asks: "If three women were alone on a desert island what would they talk about?" and the answer is: "Two would get off alone and talk about the other one."

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AND SO I GUESS when two dentists found themselves house bound on a mountain above the clouds, naturally enough they talked—dentistry. Or rather the oldtimer talked and I listened. I shall call him Oldtimer, because I promised if I ever should quote him in our Table

❖ Talks that I would not disclose his identity. Yet, all that he said ❖ was interesting, and much of it indeed valuable. ❖ ❖

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"DO YOU KNOW, DOCTOR," said he, "I keep up with the progress of ❖ dentistry, at least the progress as it is recorded in our current litera- ❖ ture, and I find that much of the so-called progress is not progress ❖ at all. Of course you will call me an old fogy, but nevertheless I ❖ venture to say that we oldtimers did many things more skillfully than ❖ they are done today. ❖ ❖

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"CONSIDER, FOR EXAMPLE, the so-called clasp dentures of today. ❖ Only a few days ago a professional friend showed me with pride, a ❖ piece that he had just finished, and I examined it closely. Beauti- ❖ fully constructed in many respects, finely finished and polished, yet ❖ it was faulty in construction and therefore a veritable trap for food ❖ debris, which would cause the patient great trouble to keep clean ❖ after meals. ❖ ❖

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"THE ERROR IN TECHNIQUE lay in the manner in which the clasps ❖ were attached to the plate. Evidently the piece had been made on ❖ a model. The clasps cast and set in place. Then connecting bars ❖ or stays were fitted and attached to plate and clasps by soldering. ❖ Now examination of the tongue side of the denture showed every- ❖ thing smooth, but by turning the plate over and examining the ❖ palatal side, it was seen at once that the solder had attached the ❖ clasps only at the extremities of the connecting bars. In other words ❖ there was a space between the bar and the edge of the plate, and an- ❖ other between the bar and the lower edge of the clasp. ❖ ❖

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"WHEN I WAS IN PRACTICE I would never have delivered a plate in ❖ that condition. Dear Old Bonwill, who first taught us this method ❖ of attaching clasps to plates, especially warned us against this occur- ❖ rence. Such a piece should be closely examined after the first solder- ❖ ing of the clasps, and if such spaces as I have described are found, ❖ the further procedure would be to boil the plate thoroughly in a ❖ strong acid bath, fill the spaces with wax, and then invest the ❖ denture so as to expose the under, or palatal, side of the plate. Then ❖ the wax is removed and fresh solder run in till the spaces are filled ❖ and the surface is as flush on the palatal as on the tongue side. ❖

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"DENTURES THAT ARE highly polished, smooth and bright on one ❖ side only, remind me of your New York houses, which have marble ❖ fronts and unpainted rough bricks on the sides and back. Why is ❖ it, my friend, that so much in this world is made for show? ❖ ❖

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"SPEAKING OF CLASPS, I noticed recently in your magazine a timely warning against the present day use of cast clasps, but there is another vicious fault to which you have not called attention. As I told you awhile ago, though not in practice I am still interested and I keep in touch, so to speak. I attend our local society meetings and our State conventions. Last year, too, I went to the National at Boston. Everybody seems to have gone mad about these cast clasps, and, of course, they have some merit, if wisely used, as for example where the clasp engages a gold crown. But what I particularly want to speak about is the faulty method now used for attaching these clasps, or perhaps I should say assembling the plate and clasps, or the saddle and clasps as the case may be.

"AS I UNDERSTAND, the common method of today is to make a cast saddle, and let us say two cast clasps. These are assembled on the original model, usually a stone model, and then joined together with solder. In some of the smaller pieces I understand that the saddle and clasps are even cast in one piece; **en bloc** as our French friends would say.

"BY EITHER OF THESE METHODS the saddle and clasps will fit, of course, sometimes; but not always, and never in a complicated case. Why? Well, let me ask you to think a minute. Suppose I put it this way. Suppose you take two apparently accurate impressions of the mouth. Make two casts in your usual way. Then make two cast clasp dentures by this technique. Do you think that those two structures would be interchangeable? That the piece made for Model A, would go to place nicely on Model B. You don't know? Well, I do, because I have tried it. Or rather I put this same proposition to one of our most skillful men in Boston, a man who does a lot of this type of work, and he was absolutely sure that he could make two such pieces that would fit either model. We made a little wager of a dinner for half a dozen friends. Well, we are to have that dinner this fall, and I am to invite the guests and my friend is paying the bill.

"NEITHER OF HIS PIECES would fit the alternate model. He was much puzzled, and declared: 'I'll wager another dinner that either one will fit the mouth?' I smiled, and replied: 'That depends on what you mean by fit. Suppose we send for the patient?' 'Of course,' said he, hedging a bit, 'a little adjustment may be necessary?' 'Ah!' said I, 'a little adjustment! Just so! But do you make a little "adjustment" to the cavo-surface of your gold inlay to make it fit?'

"MY FRIEND made me recall a little incident that occurred in my parlor one evening. It was in the time when the cut-up picture puzzle was having its day. I had brought home rather a large picture and the whole family were around the table at work putting together the pieces. A couple of young men had called to visit my girls and joined us around the picture puzzle. One of these boys was rather a wag, and after a long study of a piece that he held in his hand he took out a small penknife. 'What are you going to do?' asked one of the girls. 'I find I shall have to whittle it a bit to make it fit,' said the boy, and we all laughed. But when you make a clasp denture that you have to 'whittle a bit' to produce a fit, my friend, it is no laughing matter. At least not for the patient.

"AND THEN I TOLD him how to construct a clasp denture that would need no whittling, nor adjustment. And I am willing to tell you, though you should not require instruction on that point considering that you were with Norman W. Kingsley for fifteen years. He certainly knew and practiced the 'good old way.'

"HOWEVER, LET ME GO ON. The trouble with working solely by models is twofold. First, the model is resistant, whereas the mouth is not. The mouth is not resistant either in the soft tissues, which the saddle touches, or in the hard tissue upon which the clasps rest. Both are yielding. Secondly, the best model ever made is not an absolute replica of the month. How can it be so, since both the impression and model are made of materials that alter by expansion and contraction? Possibly duplicate models might be made, upon which interchangeable dentures might be constructed, but that would entail using measured proportions of water and plaster for the impressions and the same when making the casts. How many men do this? How many know just what proportion of water and impression plaster will produce a model most nearly like the mouth? Not many, I venture to assert.

"BUT YOUR MODELS are accurate enough if you do not rely upon them too much. Let me see if I can make my point clear. From as accurate a model as you can produce, make your saddle and your clasps. Next, if you try the saddle in the mouth, and press it to place you find it an accurate adaptation, snugly fitting the gum at all points. Then you try your clasps and they rest firmly and accurately upon the teeth. Yet, if you return these to the model and assemble them with solder, when you come back to the mouth the patient complains. He tells you 'that it is awfully tight, Doctor, and it does not seem to touch the gum.' You tell him he is mistaken, and that

❖ the plate will 'settle' in a few days anyway. You tell him this be-
❖ cause you do not want to make the piece over. And you let that
❖ patient go out of your office with a piece that is binding tight be-
❖ tween his teeth, and not resting upon the soft tissues, and when he
❖ comes back in a few days and tells you that his teeth have been
❖ pretty sore, but they are getting comfortable now, you say to him,
❖ 'I told you so.' ❖ ❖

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"NOW, AS A MATTER of fact, when that patient tells you that the plate
❖ does not rest tight against the gum he tells you the truth. Because
❖ the truth is that your cast plate does not 'rest tight' against the
❖ model. No casting that ever was made will fit the model as the
❖ same casting can be made to fit the soft tissues. But if you construct
❖ a cast clasp with occlusal stops that prevent the clasp from going
❖ further down (or up) toward the soft tissues, and then solder these
❖ clasps to a cast saddle that is simply resting lightly on your model,
❖ you produce a plate which, when first put in place not alone binds
❖ too tight against the clasped teeth, but at the same time rests too
❖ lightly against the gum tissue. ❖ ❖

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"THEN, OF COURSE, come your 'little adjustments.' These are of two
❖ kinds. The adjustment which you make by filing and stoning the
❖ inner sides of your clasps, and the adjustments which Nature makes
❖ by moving the teeth about until they 'fit' your plate, whereas you
❖ should have made your plate to 'fit' the teeth and mouth in the
❖ first place. This so-called settling of a plate always produces trauma,
❖ and often is the initial impinge which results in a periodontoclasia.
❖ Notice that I am acquainted with your new terms. ❖ ❖

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"BUT YOU WANT to know how to avoid all this. It may be accom-
❖ plished in the good old way. Take a little more time. And, by the
❖ way, you lose no time in the end. The time lost in doing the first
❖ steps correctly is more than balanced by the time saved by not having
❖ any adjustments to make. And the settlement of your bill will be
❖ more prompt if there has not been any settlement of the denture
❖ needed. As a matter of fact you are not likely to even send your
❖ bill until the patient reports that the denture is satisfactory. ❖ ❖

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"THIS THEN is the technique. As old as—well as old as I am—but still
❖ apparently not known, or at least not practiced by many. The saddle
❖ and clasps having been constructed, the saddle is fitted to its place
❖ in the mouth and when pressure is applied it is seen to go up snugly
❖ against the gum, whitening the tissue by forcing out the blood. This
❖ is a 'fit' such as cannot possibly be had on the model. If your clasps

❖ can now be so attached that they will hold the saddle in this position
❖ your patient will not claim that the plate does not touch his gum.

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"NEXT SEE THAT one of the clasps fit. Let this be emphasized. Fit
❖ only one clasp at this sitting. And never mind how well that clasp
❖ fits the model, nor how well it fits the tooth, there is no doubt but
❖ that when adjusted to the tooth it occupies a position slightly dif-
❖ ferent from that which it occupies when on the model. Thus it is
❖ seen at once that when adjusted to the mouth both the saddle and
❖ the clasp bear a slightly different relation, one to the other, than
❖ when assembled on the model. ❖ ❖

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"NEXT WE MUST obtain an accurate impression of the parts with saddle
❖ and clasp in place, one clasp only, and this can be done. But no
❖ impression tray should be used. A stout steel instrument, with a
❖ bayonet shaped bend, is used to hold the saddle tight against the
❖ gum. The clasp is adjusted to the tooth so that the occlusal rest is
❖ tight against the tooth. This is important for a reason that I will
❖ explain presently. The assistant holds the cup with the impression
❖ plaster mixed so as not to set too rapidly. The plaster is then
❖ carried to the parts with a small spatula, and is spread in small
❖ quantities first over the saddle and then all around the clasp and
❖ the tooth on which it rests. Then more plaster is quickly added with
❖ a larger spatula, until enough for strength has been put in place. ❖

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"CARE MUST BE OBSERVED throughout, to maintain the pressure of
❖ the instrument against the saddle. And this steady pressure is most
❖ important while the plaster is in its brittle stage, as any movement
❖ of the instrument at that time would disintegrate the mass and ruin
❖ the impression. If there is any doubt on the part of the operator
❖ as to his ability to maintain this steady pressure, there is another
❖ method. The pressure against the saddle may be obtained by fitting
❖ a hickory stick so that it rests against the saddle and tight against a
❖ tooth in the opposite jaw, much as a mouth prop is used when ad-
❖ ministering nitrous oxid. If the prop method is used the patient's
❖ mouth should be opened to its fullest extent partly to prevent his
❖ opening it wider and thus releasing the pressure while you are tak-
❖ ing the impression, and partly to give you all the room possible for
❖ introducing the plaster. ❖ ❖

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"ALLOW THE IMPRESSION to rest undisturbed until the plaster has
❖ fully hardened, because in this manner only will you obtain really
❖ sharp lines to guide you in reassembling your impression, clasp and
❖ saddle, after removal from the mouth. Break the impression care-

fully and remove the plaster and the saddle and clasps, being cautious to splinter the plaster as little as possible. All small chips should be brushed away with a soft brush and the impression assembled and held together with hard wax. But too much reliance should not be placed upon wax alone. It is not pleasant after assembling the impression with clasp and saddle in proper place, to drop the piece accidentally and have it all split apart, with further fracture of the margins. I dwell upon this because accuracy at this stage is a **sine qua non** to accuracy of fit after soldering. Hence I say do not rely upon wax alone. Break a match stick into short pieces and place these pieces crosswise over the fractures of the impression, and then soak match stick and plaster with really hot, hard wax.

"HAVING ASSEMBLED the impression, clasp and saddle in this manner make a cast with the most reliable soldering investment compound, and then solder the clasp to the saddle.

"WHEN THIS SADDLE with its one clasp is placed in the mouth it should fit absolutely with the saddle tight against the gum and the clasp properly in place on the tooth. If not the clasp should be removed and a new impression taken. The second clasp may now be fitted and the process repeated, except that an impression tray may be used this time, as the first clasp will hold the saddle in proper place.

"WHEN BOTH CLASPS have been attached by this technique the piece will go to place in the mouth without causing any undue pressure against the teeth, and the patient will have a comfortable feeling that the saddle is in contact with the gum.

"I SAID THAT there is a reason for having the saddle pressed tight against the gum, and the clasp with its occlusal rest tight in place at the same time. Constructed in this manner the resiliency of the gum will force the occlusal rests very slightly away from contact, when the mouth is at rest, but during mastication the piece will be forced against the gum just to the extent of the pressure that was exerted when taking the impression, and this play, though so slight as not to be noticed by the patient, makes for health of the tissues."

I THINK THE OLDTIMER would have continued his lecture, but just then the clouds broke away, as all clouds will, and the sun came out as it always does. So I thanked him and went clambering among the rocks, hoping to capture some rare butterflies and moths. I did, too.

1921.

XLIII.

WHEN WE TALK "AROUND THE TABLE," it is manifest, of course, ❖ that the table is round, but there is a characteristic of this table, and ❖ of the Club that sits around it, that may not have occurred to all who ❖ follow these records. The point is that with a round table no man ❖ sits at the head. No man, therefore, can account himself as better ❖ than his fellows. It is a truly democratic arrangement. ❖ ❖

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SO FAR AS HISTORY TELLETH, the first who conceived this Round ❖ Table method of seating, was King Arthur, he who with his cele- ❖ brated knights sat always in this fashion and recounted their deeds ❖ and adventures to the delectation of all. ❖ ❖

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IT WAS AT ONE SUCH FEAST that King Arthur told the tale of him- ❖ self and a small band of his "Merrie Men," who, while out a-hunting ❖ were overtaken by a storm and forced to seek shelter in the hut of ❖ a peasant. With a twinkling eye, too, he told of the meal set before ❖ them by the peasant's wife, and especially of the monstrous steamed ❖ apple dumpling; a work of culinary art, with a surface as smooth ❖ and unbroken as a baby's face. "And yet within were apples, Sirrah! ❖ Apples no less! Now tell me, gentlemen, Sir Knights, how got those ❖ apples in?" ❖ ❖

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IT IS A SOMEWHAT SIMILAR problem which the Secretary of the ❖ Club sets before the "Goodlie Companie" tonight. It is claimed, by ❖ some at least, that a cast gold inlay should accurately fit the cavity ❖ for which it is made. Some there be who exhibit inlays so fashioned ❖ that when seated in the cavity without the interposition of any ❖ cement, the marginal adaptation appears to be perfect. How then ❖ does this expert get his cement in? And where? ❖ ❖

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SUPPOSE THAT WE endeavor to learn what the experts think of this ❖ problem! Let us ask how they get the cement in? And where? ❖

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IN A PAPER BEFORE the Second District Dental Society, which is a ❖ component of the Dental Society of the State of New York, read by

Dr. C. S. Van Horn of Bloomsburg, Pa., and printed in Dental Items of Interest for May, 1920, this problem is specifically dealt with.

DR. VAN HORN SAYS: "A perfect cast gold inlay may be defined as one which in contour, cusps, ridges, sulci, etc., is an exact reproduction of the lost tooth structure, and when placed in the tooth cavity its marginal relationship must exactly register and be in perfect continuity with the prepared cavity margins; or stated in another way: It must be an exact metal replica of a perfectly adapted, carved, contoured, polished and scientifically manipulated wax pattern when such pattern is in the cavity in the mouth."

WITHIN PARENTHESES Dr. Van Horn then continues, and it is here that he solves this cement problem. "Parenthetically: It is to be noted that the expanded pattern technique demands that prior to investing, the entire cavity surface of the wax pattern, to within a couple of millimeters of the margins, must be reduced by scraping or carving to make room for the cement, and thus, also, assist in closer adaptation of the inlay margins to the cavity margins by reducing the so-called direct bearing surface and circumventing roughness in the cavity surface. It is a difficult proposition always to make the entire surface of a cavity mechanically smooth and even, and roughness or obtrusions tend to prevent a very close fitting inlay from going accurately to place."

THESE TWO PARAGRAPHS are moderately brief, yet they contain a great deal that is worthy of serious consideration and study. In the first place, Dr. Van Horn recognizes certain mechanical difficulties which militate against the making of cast gold inlays as we were first taught to make them. He tells us that "roughness or obtrusions" (protrusions?), "tend to prevent a close fitting inlay from going accurately to place." Also that it is difficult to make the entire surface of the cavity smooth. In recognition of these facts, Dr. Taggart and his followers have continuously endeavored to improve methods of cavity preparation, and instruments for preparing and shaping tooth surfaces, to the end that cavity surfaces may be made as mechanically smooth as possible. It is for this reason that Taggart advised against burs and other steel instruments, which not only do not form smooth surfaces, but actually produce, not obtrusions, nor protrusions, but rather indentations. Into such indentations or tool marks, the pattern wax is forced when in a yielding consistency, and thus are formed bumps or protrusions on the surface of the pattern wax, which must necessarily cause distortion

of the wax upon withdrawal, these distortions being the more important because they are practically invisible and heretofore unsuspected.

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MUCH OF THE DISTORTION of wax patterns which has been referred to expansion and contraction of pattern wax may be traceable to the tool marks made in the dentinal surface, and protrusions produced thereby upon the wax surface.

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LIKEWISE, HAS IT BEEN to meet and obviate these physical obstacles to success in making a perfect fitting inlay, that Taggart has urged the use of absolutely true stones, instead of steel tools, in cavity formation.

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DR. VAN HORN, HOWEVER, meets this and the cement problem at the same time by recourse to another expedient. Presumably he makes his cavity surfaces as smooth as he can with the tools which he uses, but, nevertheless, to overcome roughness and provide space for the cement at the same time, he tells us that "the entire cavity surfaces of the wax pattern, to within a couple of millimeters of the margin must be reduced by scraping or carving," etc.

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LET US VISUALIZE this technique by placing the wax pattern gently in the cavity, after its cavity surface has been reduced by scraping or carving to within a couple of millimeters of the margins. What then do we have. A wax pattern resting, to the width of two millimeters, along the cavity margins, and with a space between the wax and the tooth at all other places. This, of course, provides space for the cement up to within the width of two millimeters, but we are still left grouping in the dark as to what becomes of the cement which is between the tooth surface and the two millimeter margin of actual contact left upon the cavity surface of the inlay.

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IF THE CEMENT between the tooth and the inlay margins can be satisfactorily disposed of, especially remembering that part of this tooth surface is enamel, why could not the entire layer of cement be similarly accounted for, especially as the major part of the cavity surface is the dentin, which is far less resistant than enamel? Either we do not fully comprehend Dr. Van Horn, or his method leaves something to be desired, in that it does not fully solve this cement problem.

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IN STILL ANOTHER PAPER read before the Second District Dental Society we find this same problem of the cement discussed by the

❖ author, Dr. L. B. Morris, of Denver, Colorado. This paper was ❖ published in Dental Items of Interest for July, 1920. We quote the ❖ following from Dr. Morris's paper: ❖ ❖

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"NOW, SINCE WE HAVE A CASTING which exactly fits the cavity, ❖ it is evident that there is no room for cement, and the inlay will not ❖ register with the cavity margins unless the procedure is properly ❖ performed, which is as follows: Use a finely ground slow setting ❖ cement, not too thickly mixed; dry the cavity with alcohol, followed ❖ by blasts of warm air. This leaves saliva crystals on the cavity ❖ walls. Remove these by washing the cavity with a weak solution of ❖ distilled water and cement liquid. Dry again with absolute alcohol ❖ and blasts of warm air. Mix abundant quantity of cement, coating ❖ the entire cavity surface as well as the seating portion of inlay. Press ❖ the inlay to place with a rocking motion to expel the greatest portion ❖ of the cement. Now, tap the inlay with a leather covered mallet, ❖ using a soft pine stick as a piston. This will expel the balance of ❖ the surplus cement. Still our inlays do not register with the cavity ❖ margins by the thickness of the finely ground cement crystals, which ❖ are approximately one-thousandth of an inch in thickness. ❖ ❖

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"THIS THICKNESS IS TAKEN CARE OF in the following manner: ❖ While the cement is crystallizing, but still in a plastic state, tap the ❖ inlay a little harder with the mallet and pine stick. This will cause ❖ the tooth structure to compress to the extent of the thickness of the ❖ cement crystals, and it would yield much more if necessary. This ❖ makes room for the cement and our inlay is gripped by the cavity ❖ walls. Thus we take full advantage of the resiliency of the tooth ❖ structure to lock our inlay to place. Cement is not used as a sticky ❖ material, but as a wedging substance due to its crystals. ❖ ❖

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"BUT SOMEONE SAYS the resistance of the pulpal wall tending to ❖ bulge upward is working against all other walls. This would be ❖ a valid criticism had we set our inlay with a non-crystalline substance, ❖ such as lard or vaseline, but cement being a crystalline substance, ❖ the energy of the compressed tooth structure forces all crystals ❖ harder and harder against the inlay and tooth structure. The harder ❖ the resistance tries to force the inlay out, the tighter they hold to- ❖ gether. We might liken this to a man in quicksand; the harder he ❖ struggles the tighter he is held." ❖ ❖

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AS I WAS NOT ABLE to fully grasp this technique at the first reading of ❖ the description, it may be that others of our members may welcome ❖ further elucidation of Dr. Morris's theory. If I finally do compre-

hend the proposition, it is that a finely ground and thinly mixed cement may be compressed to the thinness of one one-thousandth of an inch, at which moment we shall have a visible cement line at the margins of equivalent thickness. But Dr. Morris contends that the tooth structure (chiefly the dentin?) is compressible, and that harder blows with the mallet during the crystallization period will sufficiently compress the tooth structure to make room for the cement and permit contact of the gold inlay at the margins.

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AS THE MODERN MAGAZINE WRITERS would phrase it: "This is an intriguing proposition," and as Oldtimers would say, "Interesting if true." But is it quite true? Dr. Morris speaks of "compressing" the tooth structure. He does not specially speak of the elasticity of dentin. Evidently, however, he recognizes this elasticity when he says that "the energy of the compressed tooth structure forces all crystals harder and harder against the inlay and tooth structure."

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THE POINT TO BE MADE HERE is that a material may be compressible and not elastic; but if a material be elastic it is likewise compressible. The quality of elasticity is of a dual nature. A substance which is elastic will be both yielding and resistant; that is to say, that while yielding to a force sufficiently stressful to alter its shape, nevertheless the elasticity causes an effort to resist the force and return to original form. The dictionary definition of elastic is as follows: "Spontaneously returning to, or toward a former size, shape or attitude, after being compressed, expanded or distorted in any way."

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HENCE, IF IT BE POSSIBLE, as suggested by Dr. Morris, to compress the tooth structure sufficiently to give place, or space, for the cement, to the thickness of one one-thousandth of an inch, this compressibility is due to the well-known fact that dentin is elastic. Being elastic, just so soon as a force is expressed sufficient to compress the tooth structure, the elasticity of that structure spontaneously resists and inaugurates an effort to return to original shape. Hence it is an inescapable consequence that the force which causes the compression of the tooth structure must be continuous and must be kept up until the cement has crystallized sufficiently to resist this effort of the tooth structure to return to original form. Or, phrased otherwise, the force must be kept up until the cement is so hard that it can permanently keep the tooth structure in a state of compression.

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IF THIS ARGUMENT BE SOUND (and, of course, it may not be), then

Dr. Morris cannot gain his end by mallet force, which is intermittent. This is not to say that Dr. Morris's theory has nothing to commend it. Dentin is certainly elastic; anything that is elastic can be compressed; but the point is made that if we desire to utilize the elasticity of tooth structure, as an aid in binding an inlay into a cavity, the inlay must be forcefully held in place during the setting of the cement.

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DESIRING TO LEARN DR. TAGGART'S VIEWS ON this very important subject, his attention was called to Dr. Morris's theory and an expression of opinion asked. Dr. Taggart kindly wrote as follows:

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"I THINK THAT DR. MORRIS is mistaken about the cement pressing its way into the dentin, and along the margins, into the enamel. My idea has always been just the reverse of this theory, and while this same theory has been advanced by others, I never have cared enough to dispute it. However, since you ask for them, I willingly give you my views.

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"TO BEGIN WITH, THE INLAY must fit a well-prepared cavity which has grooves so placed that the inlay, while sliding to its seat, cannot be sprung or pushed away from the cavity wall, since it is this springing away which is practically the cause of the well-defined cement line at the buccal and lingual margins and the so-called lack of fit at the gingival border.

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"YOU KNOW THAT the cement powder is made by calcining zinc oxid at a high degree of heat (sometimes as high as 3,000 degrees), bringing it back to a crystalline stage, and these grains are exceedingly hard; not so hard as carborundum grains, but for practical illustration almost as resistant.

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"THIS CRYSTALLINE MASS is crushed first and then triturated, until in a good cement the largest grains are about one two-thousandth of an inch in diameter. This dimension is smaller than the eye can detect, and it is only when such grains are collected in bulk that, in the form of cement, they become visible.

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"THESE GRAINS BEING HARDER than dentin, must find a place between the cavity wall and the surface of the gold inlay, and my idea is that the grains sink into the gold and not into the dentin or enamel, as the gold is more or less soft, or at least much more yielding than the dentin, and as the inlay is driven to its seat, which

should always be done, by which I mean that force should be used when setting an inlay, the hard grains are rolled, or imbedded in the yielding gold, and in this way the inlay is held in by frictional contact.

"THE INLAY can be driven into the cavity so tight that it cannot be removed, if we only use carborundum powder, and my idea is that the cement, as a cementing medium, is only useful because it makes a water-tight joint."

TWO POINTS HERE MADE by Dr. Taggart should be emphasized; they should be emphasized because, though told to us long ago by Dr. Taggart, they have been more or less ignored, even by some of his most ardent followers:

THESE TWO POINTS ARE, first, that there should be grooves in every cavity prepared for the reception of an inlay. Secondly, that the cement is not employed as a cementing medium, but as a wedging agent.

WHEN WE SPEAK OF GROOVES, we mean that the cavity should be so formed that the inlay may be made to enter it only in one direction, and consequently can be removed only by reversing its direction of entrance. Imagine, for example, an inlay entering a cavity as a drawer enters its intended place, and it is at once manifest that any object placed between the surface of the inlay and the surface of the gold must have a wedging action, and as displacement of this interposed substance is resisted by the surrounding walls, it necessarily follows that the interposed substance (the cement) is forced to occupy the least possible space. Thus, if the granules of the cement are sufficiently resistant and sufficiently sharp, they may be forced into the surface of the gold as Dr. Taggart suggests.

THIS SEEMS TO BE AN APPROPRIATE PLACE to call attention to the fact that many clinicians are showing beautifully made and beautifully fitted cast gold inlays, out of the mouth, which, if critically examined, would be found at once to be impracticable for use in human teeth.

IN SUCH INSTANCES the cavity walls are all made to merge toward the center to such an extent that an inlay much smaller than the original wax pattern would yet drop to place and lie in perfect contact with the walls of the clinical cavity, which the clinician exhibits with such pride.

ANY ENDEAVOR TO CEMENT such an inlay to place would expose the fallacy of the cavity preparation at once. Lacking grooves, or any other resistance form, the resistance of the cement during the setting would force the inlay out of the cavity, and thus, as Dr. Taggart explains, present cement at the buccal and lingual margins and discrepancies at the gingival.

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AS DR. HERMAN E. S. CHAYES is the author of a text-book, of nearly four hundred pages in length, dealing with the subject of inlays, it seemed but natural to expect that we might find some exposition of this point in his work. Beyond the recommendation that "any good reliable cement of an exceedingly fine grain and preferably of brown color will do," and that "the cement must be rather thinly mixed, but very thoroughly spatulated," we do not find any specific discussion of the point here raised. The problem, therefore, has been submitted to him in the following form: "If you think it essential, as you probably do, that a cast gold inlay should fit the cavity for which it is intended, with practical accuracy, will you express an opinion as to how space is afforded for the interposition of cement without lifting the inlay away from the cavo-surface sufficiently to produce a visible cement line along the margin?"

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DR. CHAYES CONTRIBUTES the following views: "I do deem it essential that the inlay when cast should accurately fit the cavity, but the problem is largely solved by the correct technique of cavity preparation. Correct cavity preparation includes such a distribution of inclined planes that when the inlay is forced to place, the tremendous forces that reside in a 'wedge' may be utilized for the displacement of the excess cement and for the compression of the cement so that it shall occupy the smallest possible space.

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"IF THIS BE ACCOMPLISHED it is manifest at once that the space required for the cement need be no greater than the greatest diameter of its largest crystals. Remember this, and then examine the surfaces against which the cement must rest. What are these? The tooth surface, mainly dentin; and the gold surface. Under a microscope both of these surfaces are seen to be 'rough,' if one may use such an expression. Even the margins of the cavity, smooth them how we may, will appear under the magnifying glass like a series of saw teeth. Is it not manifest then that if we place a gold inlay, which has a crystalline surface, against dentin, which likewise has a crystalline surface, there must be 'space' between the two, especially since the two crystalline surfaces are composed of totally

different crystals? This being true, if our cement crystals are small enough, and if the cement be mixed thin enough, and if the wedging force of the inlay be properly used, the cement can be forced out of the cavity until there is none left except that which lodges between the crystalline surface of the gold and the crystalline surface of the dentin."

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UPON READING OVER THE ABOVE RECORD it occurred to me that Dr. Van Woert at one time had made a special study of the action of cements when used for the retention of inlays. Hence it seemed wise to call him on the telephone and ask him: "What becomes of the cement when we set a properly made inlay?" The susequent telephone talk surprised the writer so much that it will most likely interest all the members of the Club.

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"YOUR QUESTION REMINDS ME," said Dr. Van Woert, "of the Englishman who was boasting that his country had a cannon so large that they used a team of oxen to draw the ball into the cannon's mouth. Whereupon the skeptic asked how they got the oxen out. And the Englishman instantly replied: 'Why, they walk out through the touch-hole.'"

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OF COURSE, BEING POLITE, I laughed at this Dear Old Joke, and then I asked: "Am I to understand by analogy, that you take out your pulps, and leave the root canals open, that they may serve as did the touch-hole, and thus allow the escape of the cement?"

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DR. VAN WOERT, with equal politeness laughed at this sally, and replied: "Speaking seriously, I long ago recognized that provision must be made for the cement, and consequently I scrape the pattern on the cavity side, almost up to the margins."

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"YOU DO NOT MEAN THAT SERIOUSLY," said I. "You do not still practice that method?" "I certainly do," was the answer. Referring then to the experiments which he had made with cement, I asked: "In your investigation of the action of cements, did you not find that the cement could be compressed to the thinness of one one-thousandth of an inch?" "I never succeeded," said Dr. Van Woert, "in getting the instrument that I wanted for accurately testing this, but that is approximately accurate. But this I did work out, that when cement is thus compressed to its ultimate thinness, it has not the strength of cement that is three or four times thicker, and that is why I resorted to scraping away parts of the underside of

the wax so that the cement would be thicker in places within the cavity than it would be at the margins."

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THIS SEEMED A GOOD PLACE to ask what becomes of the cement at the margins where the wax is not scraped. Dr. Van Woert's theory is that with an inlay shaped as he suggests the gold can be forced more closely to the margin than where the space, or lack of space is equal throughout, and that burnishing or spinning will practically obliterate the cement line.

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HERE THEN WE HAVE the two schools well defined. Those who believe with Dr. Taggart, accept his dogma that the retention of the inlay depends upon such a cavity formation that the inlay can be forced out, only in one direction, the cement being used as a wedging force, and to make the joint water-tight. Others depend upon the adhesive quality of the cement to retain the inlay.

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DR. TAGGART'S FOLLOWERS make gold fillings retained by cement. The others make cement fillings protected by gold. 1921.

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COMMENT. And now in the year of Our Lord, 1928, Drs. Henry W. Gillett, and A. J. Irving are publishing a series of articles in Dental Items of Interest, with the expressed purpose of proving that the "driving fit" inlay, is not as good as the inlay plentifully underlaid with cement. In other words, that the cement filling protected by a gold inlay, is a better filling than the gold inlay using cement for retention mainly. And they are presenting very fine arguments, and later will outline equally good technics. 1928.

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XLIV.

ONCE UPON A TIME there was a Fond Parent, who had an Only Son. ❖ Now, it chanced that one day this Only Son informed his Fond ❖ Parent that he, said Only Son, was about to be married, and he ❖ named the name of the Lady. Whereupon the following brief dia- ❖ logue occurred: "Well," said the Fond Parent, "that only proves ❖ the truth of the old adage that 'Love is Blind!' " "On the contrary," ❖ replied the Only Son, "it proves that Love is clear-sighted. I see ❖ more in the Lady than you do!" "If you are so clear-sighted," said ❖ the Fond Parent, "you cannot fail to observe that she is as homely ❖ as a hedge-hog." "As to that," answered the Only Son, "I give you ❖ adage for adage. You surely know that 'beauty is but skin deep!' " ❖ "In Heaven's name then," snapped the Fond Parent, "skin her!"

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BUT IN THIS INSTANCE the Fond Parent perverted the meaning of ❖ the adage and exhibited a sad ignorance of both physiology and ❖ pathology. The old saying may be true that "beauty is but skin ❖ deep," but speaking as one who has had experience, those who have ❖ had the skin removed find no "beauty" at the points exposed. ❖ ❖

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LET THIS frivolous introductory bring us at once to the more serious ❖ topic that we wish to bring before the Club. It is perhaps a new ❖ thought, but it is a painful fact that the more recent strides in ❖ dentistry, including radiography, local anesthesia, etc., have brought ❖ in their wake an occupational disturbance, "occupational dermatitis." ❖ This talk is addressed primarily to those who may be present suf- ❖ ferers from one form or another of this truly dreadful trouble, but ❖ it should likewise prove intensely interesting to those who have never ❖ suffered, and who may feel themselves immune. ❖ ❖

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BEFORE RECITING the experiences of some of our Club members, let ❖ us briefly digest a few articles that have recently appeared in the ❖ literature. ❖ ❖

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IN THE DECEMBER ISSUE of this magazine Dr. H. E. Tompkins seeks ❖ information in regard to "procain dermatitis," and the editor intro-

duced a footnote to the effect that "dermatitis from developing solutions seems to be quite similar to that caused by procain."

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THOSE WHO MAY HAVE, or who may have had their fingers affected in this manner, and who may have used both procain, and developing solutions may be in a quandary as to which is the cause. Interesting articles dealing with this topic have appeared in the Dental Cosmos, as follows: Dr. Arthur E. Guptil, two communications, entitled "Novocain as a Skin Irritant," Cosmos, December, 1920, and June, 1921. "Novocain Dermatitis in Dentists," by C. Guy Lane, M. D., of Boston, Cosmos, September, 1921, and C. Edmund Kells, D. D. S., in same number (p. 915), using Dr. Guptil's title, "Novocain as a Skin Irritant."

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DESCRIBING his personal sufferings which he attributes to formaldehyd, Dr. Kells says, "The character of the dermatitis from which I suffered was quite different from that described by Dr. Guptil and others." He likewise warns against novocain and metol, and adds that the facts should be given the widest publicity, with which, as one of the afflicted, anxious to save others, I heartily concur.

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THE FACT MENTIONED by Dr. Kells that his dermatitis differed from that described by writers dealing with the subject of novocain, however, must not be accepted as establishing the postulate that there are two distinct skin diseases, one resulting from novocain and one from formaldehyd or metol.

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IT IS MORE PROBABLE that the dermatitis from which Dr. Kells sufered was merely a particular phase of the disturbance which did not happen to be accurately described by Dr. Guptil. The description of the clinical appearance of dermatitis from novocain as described so well by Dr. Guy Lane, quite adequately pictures my own case, and yet I have not used novocain in any form for more than five years.

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FOR THE BENEFIT OF THOSE who may be suffering at present, or who may be attacked in the near future, a quotation from Dr. Lane will be helpful in enabling them to make a diagnosis.

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"THE DERMATITIS about which I am speaking usually begins on the hands, and perhaps between the fingers, with a slight redness and an itching and burning. The symptoms gradually increase in severity and the area spreads; there may be the appearance of slight blisters or vesicles, which increase in size and finally break down, perhaps

of themselves and perhaps because of scratching. The itching and burning are often very marked and may produce much discomfort. It may be that the whole hands are affected though the dorsal surface, which is more tender because it is not covered by the thick palmer skin, is more apt to show the more severe type of irritation. Serum exudes from the vesicles, dries, forms crusts and continued scratching and irritation result in the formation of fissures, particularly at the points of greatest flexion. The nails may be discolored and fissured, and there may be much redness and irritation about the nails."

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THE ABOVE CLINICAL picture, in the essential details, if not in all particulars will be recognized by any one who has suffered from this affliction. As to the possibility of the same or very similar conditions arising from agents other than novocain, Dr. Lane tells us that heretofore "physicians' eczema," "surgeons' eczema" and "nurses' eczema" have been attributed to mercury, formalin, iodoform, carbolic acid, alkalis and acids, and soaps of various kinds, while Dr. Guptil mentions Howe's formalin-silver solution, and x-ray developing solutions.

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BOTH DR. GUPTIL AND DR. LANE recite case histories and include conditions which definitely trace this skin trouble to novocain. Nevertheless, equally authentic cases, my own and others that will be cited, demonstrate that this occupational dermatitis is a very real and grave disease: one which temporarily incapacitates the dentist from doing his work, but which is by no means restricted to the users of novocain.

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NOR SHOULD ANYONE MAKE the mistake of accounting himself safe, merely because thus far he has escaped, despite the constant use of drugs which are causative factors. Some have argued along the lines of idiosyncrasy, and these are referred to Dr. Lane's article where he very ably discusses that subject, as well as the possibility of an acquired sensitiveness. Personally I would report that after nearly twenty years' constant and free immersion of my hands in developing solutions, this most disturbing, irritating, and painful affliction came upon me suddenly and without warning, and it is only after three years of combat with it that I have finally discovered the extent to which I have become sensitive.

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I DESCRIBE this trouble as "disturbing, irritating, and painful." It is all three; irritating from the itching, and extreme sensitiveness of the denuded areas to the slightest undue pressure, or contact with sharp

❖ edges either of instruments, or of the teeth. As was jokingly said at ❖ the outset, there is nothing beautiful about being skinned. It is ❖ painful; extremely painful, because of the burning sensation and ❖ the actual pain when fissures form. In advanced stages hypertrophied tissue protrudes from beneath the nail which is not only painful but of ugly appearance. But the disturbing element is perhaps ❖ of greatest consequence. It is disturbing, because it renders one ❖ disinclined to work, or even incapable of working. One feels that, ❖ like Othello, his "occupation" may be "gone." It is disturbing also ❖ because of the general appearance of the fingers which render ❖ scrupulous patients unwilling to have "such fingers" placed in their ❖ mouths. The fingers not only appear rough and sore but necessarily ❖ dirty. Indeed, they are dirty, because they cannot be kept clean. ❖ I dwell somewhat on this serious mental aspect of the trouble as a ❖ warning to those who have not suffered to take all precautions ❖ against acquiring the disease, or a tendency toward the disease. ❖ Fortunately, prophylactic measures are at hand and will be presented. ❖ ❖

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LET US NOW have a little "experience meeting" among our members. ❖ Acting as Secretary of our Club, I have communicated with several ❖ who have had this trouble to a greater or lesser degree. From the ❖ replies I select for presentation the two most important. Dr. Armin ❖ Wald describes his own case as follows: ❖ ❖

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"REFERRING TO YOUR INQUIRY about the cause of my skin trouble, ❖ I would say that it was due to iodin poisoning. Although I had used ❖ the tincture of iodin more or less in general practice since 1896, I ❖ had never noticed that it had any ill effect, nor had I been troubled ❖ in any way with my hands or fingers, except the usual winter chap, ❖ which was never severe. I first noticed an eczema on the skin of ❖ my fingers about the winter of 1917, and at the same time an occasional outbreak on the face. These conditions resembled ivy ❖ poisoning. I would like to add that about this time I did considerable surgery and used tincture of iodin in my work. The attacks ❖ continued with more or less severity in spite of various treatments, ❖ diets, etc., and as they did not improve, x-ray therapy was advocated and applied. The condition of the fingers seemed to improve ❖ for a time, but the acute attacks on face and other parts of the body, ❖ not treated with the ray, continued to appear at irregular intervals ❖ from a few days to two or three weeks apart. ❖ ❖

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"DERMATOLOGISTS WERE INTERESTED in my case, but it was not ❖ until December, 1920, during one of the acute face eruptions, that

the diagnosis of iodin poisoning was made. In the meanwhile the condition of the fingers grew worse and in spite of the fact that I discontinued the use of iodin my fingers did not improve. During this time I continued the x-ray treatment for the fingers as the condition there persisted and dermatologists determined that this condition was not associated with the former iodin poisoning. The only diagnosis made was 'Occupational dermatitis.' 'You are using something in your work which is irritating the skin.' Others asserted it was a functional disturbance, and in order to comply with both opinions I wore rubber gloves on my hands and wore myself out with strict diets, physical culture, etc.

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"IN JULY, 1921, I went on my vacation and in about a week my fingers became so bad that I could find no rest night or day. The pain was severe and constant, and it was not until I returned to town about August 1 that a diagnosis of x-ray burn was made. Proper treatment relieved the suffering and the skin is now slowly mending.

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"IN CONCLUSION I WISH TO SAY that since I stopped the use of iodin, that is its direct application to my skin and exposure of the skin to the fumes of iodin, I have had none of those acute attacks that resembled ivy poisoning on face or fingers, except on one occasion—a patient bit my finger, and when I removed my glove the nurse applied tincture of iodin to the open wound. Within twenty-four hours I had an acute attack on the face and fingers, which did prove conclusively the effect of iodin on my system.

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"I WOULD LIKE to add a word of warning about x-ray therapy in dentistry as advocated by Garretson in Dental Cosmos, November, 1921. Very serious burns may result from its use as a therapeutic agent. In hope that the above may be of some value in your investigations, I am, sincerely yours, etc."

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POINTS OF SIGNIFICANCE in the above history are, first, that this does not appear to have been a case of so-called "idiosyncrasy against" iodin, whatever that may be, but rather an "acquired sensitiveness," if such be possible. At all events Dr. Wald used iodin for a long period without ill results, and it was only when using it more constantly that his dermatitis appeared. Second, we hear in this case for the first time, of iodin as a possible causative agent. Third, he suffered on the face as well as the hands. Then he speaks of the "fumes" of iodin as a possible irritant, and lastly he tells of the rapid return of his trouble "within twenty-four hours" of the application of iodin to an open wound.

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IN DR. LANE'S PAPER he speaks of eruptions on the face from novocain, but attributed these attacks to spurting of the solution from the syringe. Unless, as Dr. Wald surmises, he became so sensitive to iodin, that "fumes" of the drug would affect him, the eruptions on the face seem to be explainable only as a superficial expression of a real systemic poisoning, rather than an outbreak from a topical application, as the great majority of these cases undoubtedly are, since they are curable without systemic medication.

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NEXT WE HAVE the most interesting and instructive experiences of Dr. A. S. Walker, also of New York City. Dr. Walker writes as follows:

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"THE ATTACK OF METOL POISONING from which I suffered lasted all through the winter of 1919-1920 and until August, 1921. During my vacation I dispensed with water for washing the hands as much as possible, substituting oil for that purpose, and upon my return to work I used cold cream for routine hand cleansing, resorting to the use of rubber gloves for pulp operations. Rubber gloves should be used as little as possible by one suffering from this form of dermatitis on account of the perspiring induced by wearing them. My condition was entirely cured before I corresponded with the Eastman people, so, of course, none of the remedies suggested by them were used by me."

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THE FOLLOWING is a copy of the letter sent to the Eastman Kodak Company by Dr. Walker:

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"DURING THE PAST eighteen months a form of eczema has made its appearance on the thumbs and fingers of dentists, and their assistants who have been developing the x-ray films. The first symptom is an itching of the affected parts, sometimes so severe as to prevent sleep. This is followed in a few days by breaks and peeling of the epidermis. In severe cases this may be followed by bleeding, and failure to heal for several months, the slow healing being due to frequent washing of the hands. So far as I know none of our dermatologists in New York has traced the cause of the trouble. One specialist has called it 'chemical eczema.' Having been a victim myself, I have been more than ordinarily interested, and am satisfied that it is caused by some ingredient of the developer. Would it be the 'hydrochinon'? Every case that has come to my notice was on the hands of those who have been developing. Where it has made its appearance on one hand only, it was the hand immersed in the developing solution. Some persons seem to have a complete

immunity. My nurse is an example. It has been suggested that immersing the hands in water before putting them in the developer would prevent trouble. I am writing this to you to ascertain if this trouble has come to your notice. Will you be kind enough to let me have your views?"

THE EASTMAN KODAK COMPANY replied in the following exceedingly comprehensive manner, and this communication becomes an important contribution to the study of this subject:

"WE ARE VERY SORRY to learn from your letter of January 27 that you have been troubled with what is commonly known as 'metol poisoning.'

"FROM A DIGEST of a large mass of information on the subject, it would appear that the chemical poisoning is secondary to the primary action of the alkali in the developer. This partially dissolves the skin and causes cracks to form, thus exposing the under layers of the epidermis to attack by the reducing of the developer and the oxidation products of the same.

"THE FOLLOWING FACTS have been fairly well established: That potassium carbonate in a developer is less liable to cause the trouble than sodium carbonate. This is probably owing to the deliquescent nature of the former. Sodium carbonate effloresces on the hands and causes cracking of the skin.

"THAT A NON-ALKALINE DEVELOPER like amidol does not give much trouble, though a few cases of poisoning with this developer are on record. In this case also, sodium sulphate efflorescing on the hands opens up the pores in the same way as sodium carbonate.

"THAT BATHING the hands in weak acid at intervals during development is an almost certain preventive, and several cases are recorded where a cure has been effected by rubbing well several times a day with the following:

Acetic Acid No. 8—1 oz.
Water—2 ozs.
Sodium Chlorid—1 tablespoon.
Two per cent. H Cl is also recommended.

"IF AN ACID STOP bath is used between development and fixation, the

above bathing of the hands is done unconsciously. Several persons have been cured in this way.

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"THE EFFECTIVE USE of acid as a preventive is, no doubt, due to its neutralizing action on the alkali left in the skin, and which is very difficult to remove by washing, especially when the skin is at all cracked.

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"THAT BATHING THE HANDS in potassium permanganate and subsequently removing the stain with oxalic acid has been of benefit in many cases. The action here is both to neutralize the alkali and remove any oxidation products of the developer which may have penetrated the cracked skin.

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"THE FOLLOWING SOLUTIONS are suggested:

A—Potassium permanganate	2 parts
Concentrated sulphuric acid	2 parts
Water	1,000 parts
B—Oxalic acid	20 parts
Water	1,000 parts

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"OF THE NUMEROUS OILY PREPARATIONS which have been recommended either 'Hazeline Cream' of Messrs. Burrough Wellcome, 'Cold Cream,' 'zinc ointment,' or the following:

Ichthyol	1 oz.
Resorcin	1 oz.
Glycerine	1 oz.
Zinc oxid	½ oz.
White paraffin ointment	6 ozs.

have been found to give relief and in many cases effect a cure. The action of the oily preparation is to prevent access of the developer to the under layers of the skin."

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I GIVE NOW MY PERSONAL EXPERIENCE because it may shed more light upon a condition that is none too well comprehended. My first attack was upon the tips of the index and second fingers of the right hand. I mention these localities because of a coincidence which at first led my mind along the wrong track, and this but shows the need of sound logic when studying etiologic factors. In my own mind I attributed the disturbance to the x-ray, because the only places attacked were exactly the only parts of my body

exposed to the x-ray. At that time I was using a very small aperture with my radiographic machine, and I was using these two fingers for holding films in the mouth.

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I WAS SUFFICIENTLY DISTURBED to travel down to Philadelphia to seek the advice of a well-known dermatologist, who had had considerable experience with x-ray burns in the early days. But this gentleman promptly declared it was not the x-ray. Then he asked, "Do you use formalin?" Receiving a negative reply, he asked: "Do you use metol?" When I admitted this he at once stated that it was a case of metol poisoning.

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THIS SPECIALIST GAVE me a salve, which, as I recall, contained salicylic acid, which was probably intended to cut down the growths which extruded from beneath the nails of both fingers. This was applied at night and covered with kid glove fingers. I also used rubber finger cots when developing.

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THE POINT OF INTEREST HERE is that it was exactly the tips of these two fingers that I had been immersing in my developers, when developing films, as at that time I was using the old-fashioned tray method.

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THE USE OF THE SALVE brought some improvement, and the trouble disappeared during the summer vacation, proving the old adage that "Almost any danger can be avoided by presence of mind and—absence of body." The vacation brought abstinence from the use of the developer, and probably did more to effect a cure than the salve.

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DURING THE NEXT winter I abandoned metol and used hydrochinon, because I recalled that in my more than fifteen years' experience in developing large plates in pictorial photography I had used hydrochinon, freely immersing my hands in it at all times without disturbance of any kind. However, I chanced upon a formula which develops very rapidly, and produces sharp contrasts. It is a very concentrated solution, strong in powerful caustic alkalis. I resorted to a deep holder for the developing solution and handled the films with clips. In spite of these precautions, I presume that the developer frequently reached my fingers. It is noteworthy that whereas in the former method of developing it was the ends of the fingers and the palmer surface of the tips that were affected, with the new method it was the inner, or I may say the under surfaces, of the index and second fingers that suffered. By under, I mean

the side that was downward when holding and agitating the films in the solutions.

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WITH THIS HIGHLY CONCENTRATED and rapid developer, it was essential to thoroughly wash the films, before immersing them in the fixing bath. To do this I would pass the film to the left hand and wash it under the full flow of water from the faucet. I supposed that this procedure safeguarded that hand at least; but this did not prove to be the case, and the Eastman Company have now provided us with a better method, the use of the acid stop bath.

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DURING THAT WINTER I suffered slightly on the left hand, but very intensely on the right, chiefly the two first fingers. The description given by Dr. Lane of procain dermatitis, and that given by Dr. Walker both aptly describe my experiences. A few clinical facts, however, seem worthy of mention.

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THE LITTLE VESICLES form and grow higher till they finally break. At this time a small magnifying glass will disclose minute areas entirely denuded of skin. These are highly sensitive and painful. The epidermis dies and rolls up, at which time it feels like so many knives cutting into the unprotected tissue below. Later on, fissures form, and as these fissures become extremely painful let me here mention the treatment which has proven most satisfactory to me. As soon as a fissure is noted, close it with adhesive plaster. This gives almost instant relief from pain, and hastens healing, whereas if unprotected the fissure grows longer and deeper.

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DR. WALKER advises against washing, but my own feeling is that the Eastman Company have given the best explanation of the trouble in attributing it to the solvent action of the alkalis upon the epidermis. Hence I would advise caution in selecting a soap, and would recommend Armour's super-fatted soap.

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DURING THAT PERIOD when the itching is most excruciating, there is a great temptation in drying the hands to use a rough towel vigorously. This is a form of scratching, and while it produces a sort of temporary satisfaction, it is temporary indeed, because it hastens the breaking down of the vesicles, and causes the minute denudations. The itching is exchanged for a painful burning. Hence a soft towel is best.

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THE USE OF RUBBER GLOVES, as Dr. Walker states, is unsatisfactory for long operations such as root canal work, but can be recom-

❖ mended for developing. But the technique must be perfect and ❖ rigidly adhered to. I returned from the country this autumn with ❖ my fingers perfectly cured. I resorted to finger cots, and all went ❖ well until by chance I used my finger cots reversed, so that the side ❖ which had previously been exposed to the developing solution, was ❖ now against the skin. Within three days the dermatitis appeared, ❖ and has not been entirely cured even now, three months later. ❖

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AN IMPORTANT POINT IN REGARD to rubber gloves is that there ❖ must be no break in the glove which would permit solutions to enter. ❖ This means a thorough powdering of the inner side. For this pur- ❖ pose talcum is commonly used, but oleate of zinc is said to be even ❖ better. There is a glove now on the market with a roughened exterior ❖ and a smooth inner surface. This is the most satisfactory in use, ❖ and it becomes easy after washing or boiling a glove to make sure ❖ that the outside of the glove is not used as the inside. ❖ ❖

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THIS WINTER MY FINGERS became so bad that I finally consulted ❖ Dr. Fred Wise of this city, who gave me the following salve:

Carboneol	℥ss
Ung. diachylon (Hebra lead plaster) ad	℥j

❖ This was almost magical in relieving the pain and curing and cover- ❖ ing the denuded spots. But it is black and stains the fingers very ❖ badly. After two weeks, Dr. Wise substituted the black salve with ❖ the following, which is white, and does not stain:

Anthrosal	℥j
Acid salicylic	gr xv
Ungt. zinc oxid. ad	℥j

❖ This white salve is good, but not so effective as the black. Despite ❖ the staining, therefore, I recommend the former, at least "until ❖ the worst is over." In use, the salves must be massaged well and ❖ thoroughly into the affected parts, after which cotton gloves may be ❖ worn during the night. ❖ ❖

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BEFORE CLOSING I must again refer to the acid stop bath recom- ❖ mended by the Eastman Company. My own experience proves that ❖ even thorough washing under the hydrant does not suffice. But the ❖ immersion of the exposed fingers in an acid bath after the develop- ❖ ment of each film will neutralize the alkali. This, of course, is ❖ purely a prophylactic measure, and is intended to safeguard those ❖ who have never suffered from this type of dermatitis. ❖ ❖

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PERHAPS THE SAFEST WAY IN WHICH to prevent an attack may be pointed out by telling you of the French woodchopper, whom I once saw running around a large tree and screaming with fear because a small dog was running after him and snapping at his trousers. When the farmer finally called the dog off, the Frenchman said: "By Gee, Monsieur Frank, nex' time I'm come thees place, I'm send my boy Jo'."

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THE SUREST WAY THEN to avoid this occupational dermatitis, is to have your office assistant do the developing. But if you do this have her use the acid stop bath. 1922.

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XLV.

THE TABLE TALK IN JANUARY has attracted much attention, and from letters received it is quite evident that hundreds of dentists and their assistants have suffered, or are suffering from some form of occupational dermatitis. For this reason the Club Members may very well give the matter further consideration.

ALMOST IMMEDIATELY after the appearance of the January issue, we received a letter from Dr. Arthur E. Guptil, complimenting us on taking up this subject. Upon being requested to send the club full details of his test, Dr. Guptil kindly wrote as follows:

"IN RESPONSE TO YOUR LETTER asking for something on novocain dermatitis, I will say that I am using more novocain than ever before with excellent results, handling it, however, only with rubber gloves.

"I DO NOT OFFER my experience as any argument against the use of it, but I do believe that the idiosyncrasies and all the possible actions of a drug so generally used, should be thoroughly understood. Most dentists seem extremely skeptical, and not inclined to credit even the possibility of novocain dermatitis.

"I AM SENDING A PICTURE of a skin test made last September with a solution of novocain on my left arm, as evidence that it is a positive skin irritant to me. The skin of the arm, which was in perfectly normal condition, was painted once a day for five consecutive days, making five applications in all with a 2% solution of novocain, tablet A. A decided reaction appeared on the third day. The symptoms were extreme redness, raised blotches resembling mosquito bites and terrible itching, especially at night. The skin returned to a perfectly normal condition in about two weeks without treatment.

"THE EXTREME DEGREE of my affection two years ago, was caused by a continued use of it over a period of months, not realizing that it was the cause of my trouble.

"SINCE ADOPTING a rubber glove technique while injecting (about two years' time) I have not had the slightest trouble with either my hands or face, unless in some way I broke my technique, and allowed the solution to come in contact with the skin. If the slightest irritation appears, which is usually first noticeable by itching at night, and redness, I make a study to locate the cause, and I have never failed to find the break.

"FOR INSTANCE, I was awakened one night with both my hands itching badly, and for some time I was at a loss to locate the cause. Finally it came to me that I had substituted novocain tablets for cocain pellets used for pressure anesthesia.

"FOR MANY YEARS I suffered from terrible cracks, or fissures in the ends of my fingers, making operating nothing short of misery for weeks at a time. During the past two years I have not had even a single fissure or a sore finger. As we older dentists used cocain for infiltration for years, and all the other conditions of my practice are practically the same, I can only conclude that cocain was the cause of my fissured fingers. I am perfectly content with my glove technique and absolute freedom from sore hands, and never expect to inject either cocain, novocain, or apothesine without rubber gloves."

IN REPLY TO THE ABOVE I wrote to Dr. Guptil in regard to my own case, pointing out that just when I had supposed my trouble to have been cured, and without having again used my developing solutions (which in my own case had been the cause of the dermatitis) I had nevertheless suddenly suffered a recurrence. Dr. Guptil kindly sent the following answer:

"REGARDING THE RECURRENCE of your trouble, as compared with my own recurrence, I might suggest that you may have handled something that was, in some slight way, contaminated with your developing solution. It took me a long time to hunt out the many ways in which I could come in contact with the solution, without being aware of it. Every time that a slight irritation appeared, I made a study to see if I could find the leak, and strange to say I never failed to locate the cause of the irritation. In my own case it is necessary to keep absolutely away from anything that has been in contact with the solution. For instance, one morning I awoke with itching hands, and it seemed to be all over them, and I was sorely at a loss to account for it. I went to the office and questioned my assistants and my office girl finally suggested that I was work-

❖ ing on some old syringes that had been discarded a long time, try-
❖ ing to fix up a good one from the lot, and as these had not been
❖ boiled nor cleaned—only thrown aside as they gave out, they still
❖ had enough novocain on them to affect my hands. It took me
❖ months to fully realize that I must not (100%) touch anything. I
❖ am simply suggesting what may be the cause of your recurrence.

✣ ✣ ✣

"ANOTHER THOUGHT CAME to me regarding the possibility of con-
❖ tamination of the skin from rubber gloves, as bearing upon your
❖ own recurrence. Dr. Hozag of the Metz people, suggested to me
❖ that I should not use a disinfectant to wash the gloves, before re-
❖ moving from the hands, after making the injection, because of the
❖ possibility of producing some other product between the novocain
❖ and the solution that I might use, that would also affect the skin,
❖ from its being on the surface of the gloves. The thought comes to
❖ me that possibly you may be using some chemical on the gloves,
❖ or that even soap on the gloves in combination with the developing
❖ solution, might produce a surface on the gloves that is irritating to
❖ the skin. ❖ ❖

✣ ✣ ✣

"OF COURSE I WEAR the gloves for protection only, and I simply give
❖ them a good soap wash and rinse, and then powder, and turn inside
❖ out for next time. This, in my case is sufficient, as when I do this
❖ thoroughly I never get any irritation. ❖ ❖

✣ ✣ ✣

"THIS IS SIMPLY a suggestion that might help in finding a break in
❖ your technique, as I found several in mine before I finally established
❖ a technique, which if I follow I am absolutely free from any skin ir-
❖ ritation of any sort. ❖ ❖

✣ ✣ ✣

"AS TO SENSITIZATION, DR. BURNS of Boston, who gave me the
❖ violet ray treatment for my hands and face, told me that a person
❖ might work in a chemical laboratory for years, and handle the same
❖ chemical and never have any trouble, when suddenly he might be-
❖ come sensitized to it, and it would produce a violent skin irritation,
❖ and he would be obliged to keep entirely away from it, forever
❖ after." ❖ ❖

✣ ✣ ✣

AS EXAMPLES of extreme sensitization, let me recite the following:
❖ The manicure girl who has attended to my hands for some years,
❖ recently asked if my skin trouble might be contagious, since she had
❖ acquired a spot on the back of her third finger just below the nail.
❖ I reassured her on that point, and then watched her at work. ❖ ❖

✣ ✣ ✣

SOON I NOTICED that she was dipping her cuticle knife into a fluid in a bottle, and that when doing so, the part of her finger where the dermatitis had appeared was immediately over the bottle. As a cuticle solvent she was using liquor potassium, the very purpose for which she was using it indicating its potency in producing a skin affliction.

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THE POINT OF SPECIAL interest lies in the fact that she had been using this same fluid for years without trouble, but heretofore she had poured a small quantity in a little flat dish. Thus her own fingers were never near it. But when she used it from the bottle, her finger would be over the mouth of the bottle, and hence in the path of the fumes.

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THAT A SUSCEPTIBLE PERSON may suffer without actual contact, as in the above instance, was somewhat substantiated recently. My own hands and fingers have been absolutely well for some eight weeks, but I have done no film development. A few days ago, my assistant failed to develop an important film to my satisfaction and I made another exposure and developed the film myself. As I only meant to develop this single pair of films, and was in a hurry, I did not stop to put on gloves. I was most particular not to allow so much as a drop of developer to reach my hands, but I did develop an addidtional pair of films that I found in my film box.

✣ ✣ ✣

WITHIN FORTY-EIGHT hours one of my fingers was attacked by a severe itching, the usual blisters appeared and broke, and we had established a minute area of the dermatitis. Yet I was exposed to nothing but the fumes. An application of the salve for one night restored me to comfort. 1922.

卐——————卐

COMMENT. These two Talks are published in sequence because they deal with the same topic, "occupational dermatitis." That is the term commonly used, but in connection with the hands and fingers of dentists, I think it might better be called "chemical dermatitis." It appears that the trouble may originate from novocain; from metol or other developer; from the strong alkalies in developing and other solutions; and from iodin poisoning. But regardless of the active agent, the clinical picture is the same.

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AND DO NOT BELIEVE, Dear Reader, that this Talk is of no interest to you, because you have had "no trouble." Trouble may reach you at any time, and having done so you will find it much more difficult

to cure it and to avoid recurrences, than to practice prophylactic precaution, and never have this trouble.

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BECAUSE, from personal experience I can assure you that it is a truly dreadful trouble.

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IT IS SIX YEARS since the foregoing Talks were published, and in quoting them here it seemed worth while to consult with Drs. Alfred S. Walker and Armin Wald to learn what their experiences have been in the interim. The following is from telephone conversations, and not from written reports. But the facts are probably correct.

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DR. WALKER says that he has been free from all difficulty, but that he has done no developing himself. He declares that he had developed films without any caution as to immersing his fingers in the solutions, for nine years before the onset of the dermatitis, and that by relegating this work to an office assistant he himself has recovered.

✣ ✣ ✣

THE ASSISTANT DEVELOPED films for five years without acquiring the ailment and then suffered an acute attack. Since then she is scrupulous in regard to using rubber gloves, and very cautious as to the care and cleansing of the gloves.

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DR. ARMIN WALD, it will be recalled, suffered from an "occupational dermatitis" which was attributed to his sensitization to iodin. He also told us that he had had recourse to x-ray therapy. In regard to this latter he sounded the warning that serious x-ray burns might result from this agent.

✣ ✣ ✣

HE NOW TELLS me that by avoiding contact with iodin, and by the use of rubber gloves his dermatitis has been completely cured, but that the tips of his fingers show fungoid growths under the nails, which were caused by x-ray burns. I am glad to state that this disturbance is slowly disappearing. But again he warns against x-ray therapy for chemical dermatitis. He says that a friend recently exhibited this trouble and declared that he was undergoing x-ray treatment. Dr. Wald persuaded him to abandon any such attempt at a cure.

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IT IS MUCH SAFER to avoid the chemical to which one has become sensitized, and Nature will effect a cure. Dr. Wald also warns against any careless use of rubber gloves, and when I remarked "I have told them that," he replied, "Tell them again!" 1928.

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XLVI.

ONE OF OUR CANADIAN MEMBERS, Dr. C. S. McArthur, writing from far off Truro, Nova Scotia, addresses the Club as follows: "In twenty-three years of study and practice of dentistry, I have not read a more interesting and at the same time more disappointing article than the Around the Table Chat for February. What can be the object of telling your many admiring readers of the marvelous success of an old practitioner in capping pulps, and letting the matter drop there? For Heaven's sake tell us, if you can, what Dr. Norman uses, and how he uses it?"

✣ ✣ ✣

DR. NORMAN, IN AUSTRALIA, is too far away for a prompt reply to reach us. Hence it was left to the Secretary to answer Dr. McArthur and numerous others who have written in the same vein. These replies were sent off as private mail. But then we received another from Dr. Maddox of Gainesville, Texas, quite the antipodes of Truro, Nova Scotia, so that the desire for knowledge of the technique seems widespread. At the end of his letter Dr. Maddox says: "I have only been a reader of Dental Items of Interest since last October." This statement, coupled with the fact that we have added seven thousand readers to our list since that date, suggests that even though this technique has been given before, many undoubtedly have not read of it, and consequently we trust it may be accounted excusable if we discuss it once more.

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FIRST THEN, SINCE it was Dr. Norman's communication which aroused this interest, and his technique that is asked for, let us look over his article once more and see what, if anything, we can glean.

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THE FOLLOWING PARAGRAPH, at least gives us a hint of Dr. Norman's preliminary treatment. He tells us:

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"I VERY EARLY, i.e., A. D. 1870, recognized that the microörganisms of dental caries were in advance of the floor of the cavity and outer surface of the pulp as demonstrated by the late Professor Miller in his epoch-making work, 'The Microörganisms of the Human Mouth,' A. D. 1890. To insure the deep penetration of my anti-

septic I first dehydrate the cavity as deeply as possible with absolute alcohol and warm air—then I give time for the antiseptic to penetrate the dentin, varying with the history of decay and the ocular evidence of the length of time that the cavity has apparently been under infection. I sometimes allow a ten-minute period, but occasionally forty-five minutes, or even an hour on rare occasions."

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AS FINAL SUCCESS in pulp capping will depend very largely upon the preliminary treatment, let us consider the technique here expounded. Dr. Norman tells us that he uses an antiseptic; that he dehydrates the dentin to permit a deep penetration. This is exceedingly sound advice, and is emphasized here in order to point out the error of using resins or similar substances. I believe there are pulp capping materials on the market, which take the form of a resin in which has been mixed some antiseptic. Let us study this a moment.

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WHEN OUR MUCH BELOVED CALLAHAN first introduced his rosin technique for root canal treatment he said that he did not claim that rosin would act as a germicide, but he thought that by surrounding bacteria with an adherent substance of that character he "would greatly increase the high cost of living," for the resident bacteria.

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DOES NOT THE SAME hold true of any antiseptic inclosed within the rosin? How can it escape to attack the bacteria? As to the action of the rosin itself, of course as far as it seeps into the decalcified dentin it may disturb the happy dreams of the bacteria within that zone. But what of the bacteria beyond the penetration of the rosin? Will not the rosin actually serve as a barrier between them and any antiseptic? In what direction then will they be forced to travel in search for pabulum? Whither indeed except towards and into the pulp itself? What wonder then if that pulp should resent the intrusion, swell up, as it were with rage, thus causing first pain, then strangulation, then death, then abscess, then——Oh! well, you know the list of awful diseases that follow after the tooth abscess.

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PROBABLY THE BEST way of comprehending a pulp capping method, is first to consider the conditions present and the requirements which the capping should possess.

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AND HERE, RIGHT OR WRONG, I must take issue with Dr. Norman where he advises the removal of all decalcified dentin, even though that would uncover the pulp itself. What is decalcified dentin? This

❖ is an important query. In the first place then, as its very name ❖ implies, it is dentin. It is dentin altered from its normal structure, ❖ but it is dentin in its normal position, so far as the pulp is concerned. ❖ The odontoblastic layer of the pulp lies in normal contact with this ❖ decalcified dentin, supposing that the decalcification has penetrated ❖ thus deeply. How then can any cap fashioned by man, be so ac- ❖ curately fitted over the pulp, as this same decalcified dentin? ❖

✣ ✣ ✣

BUT YOU INTERRUPT ME to remark, "Decalcified dentin is filled with ❖ bacteria?" Quite so; to some distance at least. But what does that ❖ imply? Not the removal of the decalcified dentin, but rather the ❖ removal, or at least the destruction, of the bacteria. Can this be ❖ done? ❖ ❖

✣ ✣ ✣

SOMEWHERE, AT SOME TIME (In the Dental Cosmos I think, about ❖ 1893 or 1894, if any member wishes to look it up) Prof. Miller, ❖ recounting his experiments in relation to caries, made the statement ❖ that oil of cloves has the power to destroy bacterial life in decalcified ❖ dentin, while at the same time it is the best hardening medium for ❖ dentin that could be used in the mouth. I am not sure that he did ❖ not say "in the laboratory" as well. What agent can better serve ❖ our purpose? ❖ ❖

✣ ✣ ✣

JUST CONSIDER THIS for a moment. We have decalcified dentin, ❖ leathery in structure, lying in close and indeed in normal relation ❖ with the pulp. We are told that oil of cloves will destroy the bac- ❖ teria within this mass, and at the same time harden it. Can we do ❖ better? ❖ ❖

✣ ✣ ✣

HOW THEN may we utilize these qualities? Evidently by placing oil ❖ of cloves in contact with the decalcified dentin, first dehydrating ❖ that dentin so that the oil of cloves may easily find entrance. ❖ ❖

✣ ✣ ✣

THE PRELIMINARY TECHNIQUE for pulp capping then is to remove ❖ all decalcified dentin from the walls of the cavity, and as much more ❖ as possible, without exposing the pulp. I say as much more as pos- ❖ sible, because the less decalified dentin there is left in, the less bac- ❖ teria there are to kill. Immediately over the decalcified dentin which ❖ is permitted to remain, place a pledget of cotton well saturated with ❖ pure oil of cloves. Cover this with one of the good temporary ❖ cements, placed in the cavity without causing pressure. ❖ ❖

✣ ✣ ✣

PRIOR TO PLACING the oil of cloves, however, the dehydration should ❖ be thoroughly well done so as to permit a ready and deep penetra-

❖ tion by the oil of cloves. The warm air blast is perhaps preferable
❖ to alcohol which is a cogulant and might set up a barrier to ingress
❖ of the oil of cloves. ❖ ❖

✣ ✣ ✣

THE TREATMENT IN PLACE, the patient should be dismissed for two
❖ weeks, unless pain should supervene. Sometimes the pulp, though
❖ not fully exposed, may be already so badly infected that it will die,
❖ in which case pain will result and the patient should report promptly.

✣ ✣ ✣

LET US SUPPOSE that the patient returns after two weeks, or longer in
❖ doubtful cases, with no report of pain. The tooth is carefully tested
❖ for vitality, and if the pulp be still alive, the operator may proceed
❖ with the actual pulp capping. ❖ ❖

✣ ✣ ✣

ONCE MORE, before proceeding we should comprehend the necessities
❖ of the case. We have used oil of cloves hoping that it would steril-
❖ ize and at the same time harden the decalcified dentin. But the
❖ sterilization may not be complete. One or two bacteria may have
❖ escaped. ❖ ❖

✣ ✣ ✣

A GOODLY NUMBER OF YEARS ago Dr. Edward Kirk gave me a
❖ small bottle of antiseptic pellets saying: "Try that in your root canal
❖ work!" "What will it accomplish?" I asked. "Why it will kill the
❖ last bacteria, and never forget, that that is the one you want to kill.
❖ He is not only a long-lived, hardy son-of-a-gun but he sure is pro-
❖ lific when he starts prolificking." ❖ ❖

✣ ✣ ✣

ALONG SIMILAR LINES THEN be it remembered that one or two,
❖ yes, or three or four bacteria may still be alive in that decalcified
❖ dentin. What is indicated? More oil of cloves, of course. ❖ ❖

✣ ✣ ✣

NEXT, AS TO THE HARDENING, Prof. Miller told us that oil of
❖ cloves will harden decalcified dentin, but he did not claim that it
❖ would become as hard as normal dentin. Hence it is still, in a sense,
❖ resilient. What of it? Why that will permit stresses to be trans-
❖ mitted to the pulp, and trauma will destroy the pulp in time. ❖ ❖

✣ ✣ ✣

IT IS EVIDENT THEN that what we need is, first, a prolonged treat-
❖ ment with oil of cloves, and second, a protection over the decalcified
❖ dentin that will resist pressure. This is accomplished as follows:

✣ ✣ ✣

OIL OF CLOVES is mixed with the powder of our oxyphosphate cement
❖ into a butter-like consistence. A metallic cap, preferably of platinum

❖ to act as a cover. This cap should be made concave, and should be ❖
❖ as large as the cavity will admit, so that its edges rest on sound ❖
❖ dentin. This consequently forms a bridge over the softened dentin ❖
❖ and thus protects the pulp from pressure. For ease of application ❖
❖ a tiny point should be cut along the edge of the metallic cap, and ❖
❖ this should be turned up at right angles, thus affording a tiny handle, ❖
❖ as it were, by which the cap can be taken in the tweezers and carried ❖
❖ into position. ❖ ❖

✣ ✣ ✣

THE METAL CAP, held thus in the tweezers is everted and the con- ❖
❖ caved surface filled with the butter-like paste made of the oil of ❖
❖ cloves and powder. It is then placed over the decalcified dentin ❖
❖ "butter side down," and tamped to place gently with a small ❖
❖ burnisher. ❖ ❖

✣ ✣ ✣

WHEN PROPERLY SEATED, oxyphosphate cement, mixed to a creamy ❖
❖ consistence, is flowed over it, care being observed not to dislodge the ❖
❖ metal cap, and enough cement being used to form a good protection ❖
❖ to the metallic and medicated cap. ❖ ❖

✣ ✣ ✣

BY THIS METHOD we keep oil of cloves in contact with the softened ❖
❖ dentin for a maximum of time, and the pulp itself is protected from ❖
❖ pressure strains. ❖ ❖

✣ ✣ ✣

IT IS GOOD PRACTICE, if there is time, to continue at this same sitting, ❖
❖ while the form and depth of the cavity is fresh in the mind, and ❖
❖ after permitting the cement to harden sufficiently, to prepare the up- ❖
❖ per cavity for an inlay, or whatever filling is to be used. By this ❖
❖ means the cavity may be filled a month or two later, by simply re- ❖
❖ moving the base plate gutta-percha which should have been placed ❖
❖ in the cavity as a temporary filling. ❖ ❖

✣ ✣ ✣

THERE IS A VARIATION of this procedure which is good practice ❖
❖ when the case is considered to be extra hazardous. Place in the bot- ❖
❖ tom of the cavity a considerable quantity of the oil of cloves mix- ❖
❖ ture. Then cut a piece of base plate gutta-percha of the same size ❖
❖ as the metal cap would have been. Mix oxyphosphate a little stiff, ❖
❖ but not too stiff. Place a generous layer of this on one side only of ❖
❖ the piece of gutta-percha. Place the gutta-percha in the cavity, clean ❖
❖ side down, and then spread the cement gently till it touches all the ❖
❖ side walls. When hard, this will seal the capping in place, while ❖
❖ the gutta-percha will prevent the upper cement from mixing with the ❖
❖ oil of cloves paste. ❖ ❖

✣ ✣ ✣

THIS GUTTA-PERCHA CAP of course will not afford the protection against pressure that could be gained with the metal cap. Protection against pressure therefore must be gained in another manner. This may be accomplished when preparing the cavity finally for a gold inlay. Ledges may be made in the side walls, or else notches may be cut in the occlusal surface so that the inlay does not actually rest on the cavity floor.

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SUCH AN INLAY, while in the wax should be specially treated. Immediately over the region of near approach to the pulp, a cavity or box should be cut in the cavo-surface of the inlay. When reproduced in gold this should be deepened till only a very thin layer of gold serves as the top of the box-like cavity. Before setting this inlay, this box should be filled with a temporary stopping, to prevent the ingress of cement.

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THE OBJECT of the various stages of this technique is to prepare against the possibility of pulp death. Should the pulp die after the inlay has been cemented to place, the patient is apt to return with the tooth very sore to the touch. In such event a sharp, spear-shaped drill will quickly penetrate the thin gold covering to the cavity which was made on the underside. At this point, if you ever have the experience, you will appreciate finding your drill meet soft temporary stopping rather than hard cement. Further down you will likewise be glad to find the gutta-percha cap rather than one of resistant metal.

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IN ACTUAL PRACTICE I have only resorted to this method some half dozen times, and only once did the pulp die. But the experience in that instance was sufficiently gratifying to cause me to highly recommend the procedure in very doubtful cases. Indeed the method permits one to "take a chance" that he would not otherwise dare to hazard. In my one case of pulp death, though the tooth was very painful, I readily entered through the gold inlay, and through the underlying materials so that the pulp chamber was quickly opened and relief experienced. Moreover, at a subsequent sitting the cavity through the gold inlay was enlarged, the root canals cleansed and filled, and the hole in the original large inlay repaired by a small gold inlay, thus avoiding the removal of the first inlay.

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AS A WARNING AGAINST the indiscriminate and unwarranted use of this pulp capping method I would say that the younger the patient the greater the chances of success. In older patients, or in pulps

❖ already infected, disorganized, or partly calcified, of course the
❖ treatment would often be a failure. 1922.

卐————卐

COMMENT. The observant reader will note that, in part, this Talk is
❖ reminiscent of Table Talks Nos. XXXII and XXXIV. The method
❖ of capping is practically the same, and would be omitted here except
❖ that such elision would interrupt the context, and whilst the actual
❖ capping technique is the same, the present Talk presents the subject
❖ in connection with somewhat different data.

✣ ✣ ✣

I SHOULD ADD that recently I have been using both Steridents, and
❖ "Seditive Sement," with gratifying results, thus eliminating the need
❖ of mixing my own capping cement. 1928.

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XLVII.

MR. PEARLCUTTER of the celebrated firm of Pearlcutter and Spotcash called recently upon one of our prominent Periodontists and introduced himself as follows: "Doctor, you know it Izzy Spotcash, the feller now, what paid you four hundred forty dollars last month for cleaning his teeth a few times? Sure you do! Well he says I should come to see you because he thinks by my breath, maybe I got it Peoria, though how I should got it I don't know, because I never was in that town in my life. Anyway I want it you should give a look."

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AND THE SPECIALIST examined his teeth, examined his gums; placed his finger on each tooth in Pearlcutter's mouth and made him grind the lowers against the uppers till you could hear them squeak and finally pronounced judgment: "Mr. Pearlcutter, you have Periodontoclasia."

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"AN'T IT ALWAYS the way? That feller Spotcash he has it all the luck. He gets it sore gums so bad, he spits blood, actually, and yet he only has it simple Peoria. But me, I don't even know my teeth are sick, and now I got it Periodical Achia. I suppose, Doctor, that means that no matter how much you treat it, the ache it comes back periodical?"

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THE SPECIALIST SMILED as specialists will, and explained the situation as specialists do, making one thing at least clear and that is how fortunate Mr. Pearlcutter was to get into proper hands. Then the treatment began, and for an hour or so every day for a week he ground away at the tops of Mr. Pearlcutter's teeth, until finally the patient lost patience and entered a protest.

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"DOCTOR PLEASE," said he, "wait a minute. An't it now the truth that if you go down another inch you'll hit the nerve or something? Y'know those teeth didn't hurted me none when we started, but now you got them started, they don't never stop hurting. I just can't bite anything sour, or sweet, or salty, or hot, or cold, and most of

❖ the food I get is just one or the other! Maybe those teeth was
❖ better the way they were first off. Hey?" ❖ ❖

✣ ✣ ✣

SO THE DOCTOR patiently explained that grinding teeth does occasion-
❖ ally make them sensitive, but that the sensitiveness passes away in
❖ time. Then he added: "You see, Mr. Pearlcutter, if you had left
❖ your teeth as they were, the disease would have grown worse and
❖ worse, until you would finally have lost them. It is of course un-
❖ fortunate that I must grind your teeth, but it is better for you to
❖ lose a part of the tooth than to lose the whole tooth. Just to show
❖ you that I am treating you fairly, I may say that I have a little incip-
❖ ient periodontoclasia myself and I am having my own teeth ground to
❖ proper adjustment." ❖ ❖

✣ ✣ ✣

"YES, I KNOW, DOCTOR," said Mr. Pearlcutter, "that's all right you
❖ should got it ground your own teeth. But now you are grinding my
❖ teeth, and that's something else again. Besides you say it yourself
❖ your toothache is insipid, but believe me there an't nothing insipid
❖ about mine. But you said something about adjustment, and that's
❖ a langwidge now what I know all about. So just make it out a bill,
❖ Doctor, and we'll have a little adjustment right now. You've cured
❖ me of the Periodical Achia, anyway, because when I first came the
❖ ache may be was periodical, but now my teeth, they ache me all the
❖ time!" ❖ ❖

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THE ABOVE STORY cannot be vouched for but it was told to me by a
❖ friend who in turn is a friend of both Pearlcutter and Spotcash, and
❖ I give you the story for what it is worth. There is a moral in it any-
❖ way, so "Attention, Periodontists!" ❖ ❖

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ONE OF MY OWN patients has been treated by a specialist this past sum-
❖ mer and she makes the same complaint, namely that her teeth are all
❖ so sensitive from the occlusal grinding that she can not eat with com-
❖ fort, nor tolerate heat nor cold. She declares that her teeth are
❖ undoubtedly tighter, and her gums in better health; still, as she truly
❖ says, one's teeth are meant for mastication and she cannot chew food
❖ with comfort. ❖ ❖

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HERE WE FIND ourselves, or rather the periodontist and his patient find
❖ themselves in a dilemma, but possibly there is a way out. Does the
❖ following little story suggest a solution? ❖ ❖

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MRS. PARTINGTON, being a tender-hearted lady and fond of dogs,

❖ was passing a stable door once when she heard a Dog whining. ❖ Stopping to investigate she saw one of the Stablemen clipping a ❖ Dog's ears. At once she protested. "My good man," said she, "you ❖ should not be so cruel. Why do you cut off that Dog's ears all in ❖ one day? Why not cut off a little every day and let the Dog get ❖ accustomed to the operation?" ❖ ❖

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THE OCTOBER EDITORIAL dealing with the topic "Practical Den- ❖ tistry" has brought forth numerous letters, some of which will merit ❖ a place in our club records. The following, from Dr. Morris H. ❖ Golden of Philadelphia, offers a contribution to practical dentistry ❖ from a clinical standpoint, and is heartily welcomed. Dr. Golden ❖ writes as follows: ❖ ❖

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"IN YOUR EDITORIAL in the current issue of Dental Items of In- ❖ terest, your discussion of "Practical Dentistry" is very practical in- ❖ deed, and I heartily agree with your expressions. ❖ ❖

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"HOWEVER, FOR THE BENEFIT of some Club Members who would ❖ have practical dentistry served in another dish, I wish to offer a prac- ❖ tical suggestion which is useful in every day practice, and if it please ❖ you you are at liberty to transmit or broadcast it to the profession.

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"I BELIEVE that I will not be contradicted in saying that a synthetic por- ❖ celain filling will be denser and more homogeneous in mass if said ❖ filling is permitted to set, or harden, under sustained pressure. ❖

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"I ALSO BELIEVE I am right in saying that the best place for the use ❖ of synthetic porcelain is in Class 1 and Class 3 cavities, especially ❖ the latter. ❖ ❖

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"HERE IS HOW I fill a Class 3 cavity with synthetic porcelain. Having ❖ prepared the cavity, I cut a strip of celluloid about one-half inch ❖ longer than is necessary to completely encircle the affected tooth. ❖ One end of the strip is passed through the interdental space next ❖ to the cavity while the other end is passed through the other inter- ❖ dental space, thus half way surrounding the affected tooth, the ma- ❖ trix now being in the shape of U. ❖ ❖

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"HERE IT MUST BE NOTED that where the cavity faces labially, the ❖ free ends of the matrix protrude labially, and where the cavity faces ❖ lingually the ends of the matrix extend lingually. ❖ ❖

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"THE MATERIAL is now mixed, and introduced into the cavity generously and deftly, the ends of the matrix are brought together firmly, and held that way by a small pair of hemostatic forceps, thus eliminating the human element in the setting process, and maintaining even and sustained pressure." 1922.

XLVIII.

THE SPORTING WRITERS and race track tipsters usually announce what they call "the one best bet." Your Club Secretary, having just returned from the Callahan Memorial Meeting, feels it incumbent upon himself to report the one best technique which he saw demonstrated.

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HE ATTENDED a session of the Root Canal Unit of the Detroit Clinic Club and was especially attracted to the demonstration of "Filling the Root," presented by Dr. Harold Slocum. After describing fully the Club's antiseptic methods of handling adult teeth, he declared that temporary teeth should be saved, and that when pulpless their roots should be filled. He explained their technique for doing this and exhibited enlarged radiographs, taken two years after canal filling, showing that root resorption and the progress of tooth eruption had been in no manner interfered with.

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THE TECHNIQUE for managing the roots of temporary teeth is here given. The canals having been cleansed, the following paste is prepared. The ingredients are, zinc oxid (Hubbock's preferred), silver nitrate flour (prepared by Williams) and eugenol. The exact proportions may be had of Dr. Slocum, but do not seem to be essential, as, after placing all three on a slab he did not use up all of either, except the one minim of the silver nitrate powder. The three are mixed into a thin paste. As to the consistency of this paste, if it cannot be picked up with a canal broach, it is too thin; and if when picked up it will not drip off the broach it is too thick. This paste is dripped into the canal with gentle instrumentation until it rises to the opening of the canal in the pulp chamber. This must be done very gently, so as not to cause pain to the "baby" patient. This is then covered with temporary stopping in the pulp chamber, and packed gently but firmly into place. The word "gently" is used here three times; but then with kiddies one must be three times as gentle as with adults.

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THE TECHNIQUE for softening and introducing the temporary stopping is interesting and ingenious. The operator has before him a

small vessel containing alcohol, into which all instruments are dipped immediately after use, the instrument then being passed through the flame and the alcohol burned off. When ready to place the temporary stopping, a small piece is picked up with the tweezers and dipped in the alcohol. It is then passed into the flame and ignited and as soon as this flame dies down the temporary stopping will be found to have softened to just a nice consistency for packing into the canal. It is a pretty trick and entirely aseptic. Try it.

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DR. SLOCUM related a good story to illustrate the extremes to which men go in accounting for their vagaries in dental practice. A mother brought a young child to Dr. Slocum for treatment, and he found several temporary molars with cavities. When he suggested filling these, the mother was much puzzled. "Our last Dentist," said she, "told me that baby teeth should not be filled." "Did he tell you why?" asked Dr. Slocum. "Oh, yes!" said the mother; "He explained that the second teeth are growing right under these baby teeth, and he said that this decayed matter passes down the roots, and nourishes the young, growing tooth!"

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DR. SLOCUM did not tell us the name of this dental scientist, but he must be practicing in the Farming Belt, and he must have seen farmers making things grow by using fertilizer. Evidently no decayed matter is reaching his brain. 1923.

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XLIX.

I THINK I can interest the Club Members with a recital of a discussion which I heard last evening between certain prominent dental specialists. Last evening, be it remembered, was New Year's Eve, and it is customary in Little Old New York to sit up and see the old year out and welcome the New Year in. This particular rite usually occupies one entire minute, beginning at 11:59 and ending 11:60 P. M., December 31st. In order to be up and doing at this important minute, New Yorkers must eat a few courses of Table d'Hote food and drink coffee—or something—for an hour or two previously.

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THIS SACRED CELEBRATION may occur in one's own house, in which event it is most expensive for the one who is in his own house. The preferable method, therefore, is to Engage a Table at one of the fashionable restaurants, and "Go Dutch."

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NOW IT HAPPENED THAT I was one of the Dutchmen at a feast last night, which was nominated on the invitation, "A Special Dinner for Specialists." I did not quite comprehend the situation until we foregathered at a Round Table, when I noted "among those present" an Orthodontist, a Periodontist, an Exodontist and a Castgoldinlayodontist; and that last specialist, is some specialist, I assure you.

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PUZZLED TO KNOW just what sort of Specialist I had been accounted to have received the invitation, I made bold to ask. And the answer certainly explained my status. "Oh, well," said the Orthodontist, "of course you are just a plain dentist, but then you are the Secretary of the Round Table Club, and we want this Talk reported. At least, I do, because I am going to start something. That is to say, I will if that Jazz Band ever takes a recess."

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NOW, IT IS A WELL-KNOWN fact that it was the Cabaret which "took the rest out of restaurant, and put the din into dinner." Hence, as there was much Cabaret at the Ritz that night—had I mentioned that we were at the Ritz? No? Well, we were! Well, what with the Cabaret and the Jazz Band, and the clatter of dinner utensils,

❖ and the popping of sarsaparilla and ginger ale corks, it was not so ❖
❖ easy to get a full and complete report of the discussion, but, the ❖
❖ following is the substance of the argument: ❖ ❖

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TRUE TO HIS PROMISE, it was the Orthodontist who started the Talk.
❖ "I wish to remind you all," said he, "that, not so very long ago, we ❖
❖ were all, like our Magazine friend here, just plain dentists. When ❖
❖ we filled teeth with gold we filled them with pure gold. Why? For ❖
❖ one reason it was 'the easiest way' and Chorus Girls are not the only ❖
❖ Folks who travel that path. Pure gold was the only sort that could ❖
❖ be made cohesive, and it sure was satisfactory to have the pieces ❖
❖ stick together." ❖ ❖

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"YOU ARE NOT ENTIRELY CORRECT there," interrupted the Inlay
❖ Man. "Myself, for example. I often filled teeth on the occlusal ❖
❖ surfaces with a combination of gold and platinum." ❖ ❖

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"I KNOW YOU DID," replied the Orthodontist, "but I had not in-
❖ tended to bring it up against you. But even so, filling with that ❖
❖ combination of gold and platinum never did become a popular in- ❖
❖ door sport. It too often happened that about the time when you ❖
❖ completed the filling about one-half of it would separate from what ❖
❖ had gone before, owing to poor cohesion." ❖ ❖

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"I NEVER HAD any trouble like that!" declared the Inlay Man. ❖ ❖

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"NO, OF COURSE NOT," said the Orthodontist. "But you never have
❖ any trouble with anything you do. We can't all be as clever as you ❖
❖ are. But let that pass. As you say, you often filled teeth with gold ❖
❖ and platinum. Now tell me why?" ❖ ❖

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"BECAUSE," said the Inlay Man, "I wanted something harder than pure
❖ gold to stand up under forceful mastication." ❖ ❖

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"EXACTLY," said the Orthodontist. "Now you have said it, and you
❖ should be ashamed to have said it. Now, Boys, let us study this ❖
❖ out. Our friend here noticed that certain persons wear their teeth ❖
❖ badly on the occlusal surfaces. The enamel disappears from the ❖
❖ incisal edges of incisors and cuspids, and from the cusps of the mas- ❖
❖ ticating teeth. Then the dentin becomes cup-shaped and eventually ❖
❖ the patient wants these places filled. In such cases you used gold ❖
❖ and platinum foil, did you not?" ❖ ❖

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"I DID," said the Inlay Man. "I wanted a filling that this type of patient could not wear out as they do pure gold. And that is the reason why I use an alloy of platinum in my inlay gold at the present time."

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"JUST SO!" said the Orthodontist. "Now we are getting at the milk in the cocoanut. Now, what did you gain? No, don't try to tell me. Let me tell you. You won't admit the truth, perhaps not even to yourself. You did not put in these platinized gold fillings, and you do not insert those platinized gold inlays in the interest of your patients."

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"I CERTAINLY DID," exclaimed the Inlay Man, getting excited. "I'd like to know what other reason I had."

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"I TOLD YOU YOU WOULD NOT admit the truth," said the Orthodontist, smiling. "Now let me tell it to you. You use that hard gold because you don't want your nice polished gold fillings, or inlays to get all battered up. You want them to stay pretty, so your patient will run around telling Folks what a smart dentist you are. Oh, I know! You can fool your patients, and you can fool yourself, but, Boy, you can't fool your Uncle Jonathan. I know!"

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"YOU KNOW A LOT!" laughed the Inlay Man. "About Orthodontia, maybe!"

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"SURE, MIKE!" admitted the Orthodontist. "And now tell me something. What is the first, second, third, and last principle of Orthodontia? Occlusion, is it not? It is! Now then! Your man comes in who has 'chewed' off (there is no better word)—who has chewed off about a fifth of his teeth. And you fill a few teeth above and below with hard gold fillings (or inlays). Then what happens? Does that man stop chewing with force? Does he begin to eat slops and soft victuals just to keep your pretty inlay shiny? He does not! He goes right on eating crusts, chewing chicken bones, and biting nuts open with his front teeth. What is the result? He goes on wearing out those teeth that you have not meddled with, and as he cannot wear out your hard gold inlays, they become high points along his occlusal plane and you have practically produced for that man a traumatic occlusion!"

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"THAT IS MY OPINION EXACTLY," interrupted the Periodontist. "I have always said——"

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"DON'T SAY ANYTHING YET, SON," said the Orthodontist. "I'll get to you presently. First let me tell this Inlay Man why he ought to use pure gold for inlays. In the first place, Taggart told us that you can get a better fit with pure gold, but let us admit that you get a good enough adaptation with the harder gold; there is another reason for using the softer metal. Its very softness commends it. Use soft, or pure gold inlays in the mouth of that same man who 'chews' so hard that he wears all the enamel from his occclusal surfaces, and be sure that your gold inlays are properly shaped and properly occluded, and highly polished, and what happens? A year later that man will return, and you will notice little facets of higher polish on your nicely occluded inlays. That does not mean that your inlays were not correctly occluded at the outset. It merely indicates that as that man wore away his enamel he developed, or rather would have developed, high points on the inlays had they been resistant enough. But, being soft, he wore away the inlays in proportion as he wore down the entire occlusal plane. And that is not all. Polish all those inlays thoroughly until you are sure that none unduly touches in any of the excursions of mastication, and yet, in another year the same bright spots will again appear on the inlays. Indeed, they are an exact index to the amount of occlusal wear that is going on. With hard gold inlays you get first a traumatic occlusion and later a periodontoclasia."

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"THAT IS JUST WHAT I WAS going to say," declared the Periodontist, "when you interrupted me. There is no doubt that inlays, even soft gold inlays, are a factor in producing traumatic occlusion. True, enamel apparently is a much harder material than gold, but still it wears faster. Its very hardness engenders a waste under attrition, whereas the softness of the gold results in a drag, rather than the frictional dissolution that we observe with enamel. Hence we are often obliged to grind inlays in our effort to get rid of traumatic occlusion."

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"THAT MAKES IT YOUR turn," said the Orthodontist. "You grind the inlays to get rid of traumatic occlusion, and, by George, very often you get rid of the occlusion itself at the same time. And that is not all. I have known of cases where even the inlays themselves were 'gotten rid off.'"

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"WHAT DO YOU MEAN?" asked the Periodontist.

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"WHAT I MEAN," said the Orthodontist, "is just this: Not so long ago, when gold inlays first came into style, the dentists made them

❖ flat, just as they had always made their gold fillings. Habit, I suppose. Then the Orthodontists set up a howl. Why not carve up your wax patterns so that your occlusal surfaces look at least theoretically like human teeth? Funny thing is that the dentists took up the suggestion and nowadays at least two out of every ten dentists —God bless the two—are putting in right good inlays—good to look at and good to eat with. How do you think a dentist like that feels when he sends a patient to a Periodontist and the Periodontist grinds all the shape out of those inlays till the Inlay Man can't tell his own inlays from the other fellows?" ❖ ❖

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"BUT THAT CAN'T BE HELPED," declared the Periodontist. ❖ ❖

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"CAN'T IT?" asked the Orthodontist. "You have another guess coming to you, Boy. But let me get on with my story. I said that you Periodontists sometimes get rid of the inlays themselves. How? Let me explain. Now, I never made a gold inlay in my life, but I know something about cavity preparation, and I know this: Very often a patient has an approximal cavity, so large that a retention extension must be made into the occlusal surface. Now, this type of extension is very simple and easy in Celluloid Teeth. But not so easy, Son, in a Live Tooth in the jaw of a Live Man. There is the little thing he calls the 'nerve,' right close by, and not so far down. However, our friend here, the Inlay Man, gets his extension cut as deep as he dares, and sets his inlay. Next year, in a moment of mental aberration, or because the X-ray Laboratory Crowd tells him he is over forty and one of the four out of five who has pyorrhea, he goes to you, Friend Periodontist, and straightway you trim off the tops of that man's teeth, and you stone away about all of that retention extension, and you leave that approximal part of the inlay with nothing but a little cement to keep it in place. Then what? One day at dinner the Man eats that $50 inlay out of his tooth, and what does he do? He does not go back to the Periodontist and say, 'You ground out one of my inlays. No! He goes back to our Inlay friend and he says, in a tone of annoyance: 'Doctor, that beautiful inlay you put in last year has come out.' Then the annoyance becomes mutual. But when the Inlay Man discovers the truth; when he learns that it is not a case of resetting but rather of remaking the inlay, and when he further discovers that there is no longer any place in which to cut a retention groove without exposing the pulp, then—why, then the annoyance is no longer mutual. It just slops over one-sided." ❖ ❖

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"BUT," said the Periodontist, "that is all very unforunate. But there is no help for it."

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"ISN'T THERE?" said the Orthodontist. "There is!"

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"THERE IS?" said the Periodontist. "Well, if there is, and you know the answer to this problem, tell us what it is."

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"I WILL SOME DAY," declared the Orthodontist. "But not now. There go the lights. Happy New Year, everybody!"

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IT WILL BE NOTICED that personally I took no part in the above discussion, but I chanced to come home with the Exodontist, who also had been a silent listener, and he asked me what I thought of all that the Orthodontist had said, and this gave me opportunity to say at least a word or two.

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"IT SEEMS TO BE a professional triangle," said I. "The Orthodontist wants the Inlay Man to insert contoured gold inlays so that his corrected malocclusion cases will stay put. The Inlay Man does this, but the Periodontist says that he is causing traumatic occlusion, and grinds away the inlays and the teeth to nice flat surfaces, and grinds away also the extensions that retain the inlays in place. Then the Inlay Man yells, 'How do you expect me to insert inlays if you cut the teeth away almost to the pulps?' And the Orthodontist rages and says, 'What is the use of my curing a malocclusion if you are going to grind away all the inclined planes so that the teeth will all drift back?' Then the Periodontist answers and says, 'Of what use are your beautiful inlays if they produce traumatic occlusion and periodontoclasia?'

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"I AM REMINDED of an old Negro vaudeville dialogue that went something like this: 'What you doin' these days, Sam?' 'Don't have to do nothin'. I is one o' dem fellers.' 'What fellers?' 'Dem fellers wid the power!' 'What power?' 'De power of a Hoodoo!' 'A Hoodoo! What's a Hoodoo?' 'Why, one o' dem fellers!' 'What fellers?' 'Dem wid de power!' 'What power?' 'De power of a Hoodoo!' 'But what's a Hoodoo?' 'A Hoodoo am one o' dem fellers, you fool nigger! An't I done tole you? Shucks.' "

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"I SEE," said the Exodontist. "But what do you suppose is the Orthodontist's solution of this professional tangle or triangle, as you call it?"

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"I WILL ASK HIM some day," said I.

"DO SO," said he, "and if you learn tell me. Happy New Year!"

"HAPPY NEW YEAR!" 1923.

COMMENT. The years have passed, and the Orthodontist has never told me his method of correcting traumatic occlusion without destroying and endangering the loss of an inlay anchored in the occlusal surface. Yet the solution to this problem is simple enough. Take a radiograph to learn the depth to which the inlay anchorage extends, and, if shallow, do the major part of the grinding on the antagonizing tooth. 1928.

L.

NEXT THE SECRETARY must advise all our members to carefully read Dr. Nesbett's article in this issue (September, 1923), in which he describes his own technique for making so-called Nesbett bridges. Particular stress should be placed upon the fact that Dr. Nesbett recommends this type of bridge only where it is indicated, and this field is much smaller, according to his views, than the field in which hundreds of men have been using the cast clasp bridge.

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IT SHOULD LIKEWISE be noted that Dr. Nesbett does not recommend cast clasps for plates.

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ANOTHER FACT WORTHY of note is, that Dr. Nesbett does not cast his saddle and clasps all in one casting. Neither does he make up a bridge from a single impression and model. Indeed he uses his first model for making the clasps only, and these are then fitted to the natural teeth before taking the impression for the saddle. Dr. Nesbett's method of taking this impression should be carefully studied by those who wish to make "Nesbett" bridges.

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FOR TAKING THE BITE, Dr. Nesbett recommends placing some modelling compound on the gold saddle, trimmed so that the opposing teeth just clear it, when in central occlusion. This is chilled and dried and enough beeswax is placed on the surface to give a good impression of the opposing teeth cusps.

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RECENTLY I HAVE BEEN experimenting a little along the line of taking the bite, for these small cases, not only for bridges, but for jacket crowns, and it may be of interest to record the results obtained.

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IN ADDITION to the method described by Dr. Nesbett for taking the bite, it has been the custom of many to take likewise an impression of the opposing teeth, and a model from such impression is assembled into the depressions made by the cusps in the beeswax. There is no doubt that in many cases, a good model of the opposing teeth

will serve better as a guide for setting up the teeth, than the model merely of the cusps.

MANY HAVE TRIED to obtain such impression at the same time as taking the bite, but they have not usually been very successful. The common method is to use pink paraffin wax and use enough of it to obtain deep impressions from the opposing teeth. As the patient forces his teeth into the paraffin wax, it spreads, or crawls away from the teeth both buccally and lingually. The operator then, with his finger, forces the wax back against the buccal surfaces of the teeth, and he requests the patient to do the same on the lingual side, effecting pressure with the tongue. This is rarely successful. The most common result is a fairly good impression of the buccal surfaces, and only a partially accurate impression of the occlusal and lingual surfaces. Very often the bucal cusp impressions may be good, while the impressions of the lingual cusps will be badly "drawn."

AFTER VARIOUS EXPERIMENTS I have overcome this difficulty, and can easily obtain perfect bites. After the bite has been taken in paraffin wax, as above described, the saddle with wax, is removed from the mouth, chilled and all excess wax trimmed away. The wax is then waxed fast to the saddle. As has been stated, at this stage we have a good impression of the buccal surfaces, an indifferent impression of the occlusal surfaces, and no impression whatever of the lingual surfaces.

NEXT WE CUT a narrow strip of paraffin wax, and wax it tight along the lingual side of the bite wax, thus forming a lingual wall, so to speak, to the boxed-in impression. This box, or trough, is now partly filled with melted wax, dripped in with a spoon spatula, and when this added wax, which now completely fills the original imprint of the cusps, has just slightly hardened, the saddle and bite is dipped for a moment into a bowl of cold water, care being observed that no water gets within the trough. The object is merely to chill and thus stiffen the outer walls of the box or trough. This is then quickly placed in the mouth and the patient's jaws guided together in central occlusion. The bite wax is then further chilled with a spray of cold water, and upon removal a perfect impression of the opposing teeth will have been obtained.

ANOTHER AND PERHAPS even better method, is to start as recommended by Dr. Nesbett with modelling compound. When this has been firmly attached to the saddle and trimmed so that the opposing teeth just clear it when the jaws are closed in central occlusion,

❖ instead of adding wax, add a layer of Kerr's, or similar modelling
❖ compound. ❖ ❖

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THE UNDERLYING COMPOUND being hard and hence resistant,
❖ prevents the yielding of the upper and softer layer of compound, so
❖ that a fairly accurate bite will be obtained in this manner, even
❖ though the opposing teeth are permitted to enter the compound to
❖ a considerable distance. ❖ ❖

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OCCASIONALLY the modelling compound will follow the same course
❖ as the paraffin wax, and will crawl away from the teeth, though not
❖ to the same extent. This bite is then removed, and chilled
❖ thoroughly. Then, the impression of the opposing teeth is partly
❖ filled with hard wax, dripped from the spoon spatula, and this is
❖ returned to the mouth and a new bite taken. The modelling com-
❖ pound being stiff, and the hard wax being quite soft, instead of
❖ spreading, the hard wax is forced up along the lingual and buccal
❖ surfaces of the teeth, resulting in a very perfect impression and bite
❖ combined. 1923.

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COMMENT. In the present day, when the importance of the proper
❖ occlusion of artificial substitutes is being daily more recognized, the
❖ accurate bite impression becomes absolutely essential, and since
❖ the publication of the above I think I have worked out some refine-
❖ ments of technique which may be helpful. ❖ ❖

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AS CORRECTLY STATED ABOVE the common method of taking a bite
❖ is to use a mass of pink paraffin wax on the jaw in which the restora-
❖ tion is to be placed, and then to have the patient force the antagon-
❖ izing natural organs into this wax, which is softened for the purpose.
❖ The result is usually a distorted representation of the very section
❖ that we most desire to have accurate, viz: the opposing natural teeth.
❖ The patient having closed his jaws, we ask him to press the lingual
❖ wax against his teeth with his tongue, while we do the same on the
❖ buccal side. ❖ ❖

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I BELIEVE THAT there is a better method. Let us suppose first that
❖ we are supplying an individual crown, on a natural root. We con-
❖ struct a cast base for the natural root, fit it nicely to the root end,
❖ and next we need a working model showing the casting in place and
❖ the adjacent teeth correctly represented. For this purpose we take
❖ a plaster of Paris impression. This is set aside temporarily. ❖ ❖

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NEXT WE MUST take the bite impression. The prevalent method is to force a mass of softened paraffin wax over the root end with its casting, and over the natural teeth in that jaw, and then ask the patient to close. It is in this act that we defeat our main purpose, because as the patient closes the wax moves away from the intruding teeth. It is for this reason that we ask him to use his tongue on the lingual side while we press with the finger upon the buccal surface.

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LET US JUST REVERSE this technique. Take a mass of softened wax, and force it over the antagonizing natural teeth, adapting it close against the lingul as well as the buccal surfaces with finger pressure. Chill this and remove it. When stiff, replace in the mouth and trim away the occlusal surface of the wax until it is just too long for the patient to close. Then soften the occlusal surface only, of the wax, place it into position and have the patient bite. We get only a shallow impression of the teeth adjacent to the crown to be constructed, but that is really all that we require; an index by which we may adjust this bite wax to the working model when made. By this means we obtain perfect replicas of the teeth in both jaws.

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TO ADAPT THIS TECHNIQUE to places where we are to use a saddle, begin as recommended by Dr. Nesbett. Place modelling compound on the saddle and trim the occlusal surface so as to just clear the antagonizing teeth. Take the wax impression of the opposing natural organs as above described, and trim the wax to slight contact with the compound on the saddle. Place both in position and unite the wax-bite, and the compound on the saddle with a hot spatula. 1928.

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LI.

BROTHER KELLS has dropped the following into our question-box. If any Club Member, or any other one can answer it, please do so. Dr. Kells writes:

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"HERE IS THE PROBLEM. A young girl of twenty presents with an upper bicuspid containing a large and apparently satisfactory gold inlay. This tooth has never given the patient the slightest indication of trouble. Skiagraph shows apical area apparently normal. Question: By what means or test (other than clairvoyance) can one decide that the pulp is 'slowly dying?'

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"INFORMATION AWAITED with interest!"

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THE SECRETARY has had no experience with "slowly dying" pulps that show no troublesome symptoms. Perhaps though, if Brother Kells would take a radiograph, or even a radiogram, he would get some "up to date" information as to the apical area that is not indicated in his "skiagraph." Don't be angry, Brother. You make skiagraphs, and I make radiographs, but nowadays they tell me that the radiogram is the "last word" in dental diagnosis.

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BROTHER KELLS'S problem reminds us of the old classic, "How can one tell a mushroom from a toadstool." Answer: "Feed some to your mother-in-law. If she dies they were 'all right.' " Same method applied to slowly dying pulps would suggest that you remove the pulp and look at it. Some better method however would be welcomed—especially by the patient.

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THIS BRINGS US most appropriately to a letter from Brother Milford S. Sorley, of Chicago, Illinois, who writes as follows:

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"NOW THAT THE discussion on death of pulps, due to gold inlays, has closed, I wish to say that I was much interested in the furor with which the argumentative battle was waged. Some night, when you Knights of the Round Table assemble, ask the others this question: 'How many pulps die from thermal shock, and how many die from

❖ bacteria impregnated dentin, and how do you distinguish between ❖ the two styles of death?' ❖ ❖

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"AS I UNDERSTAND it, active hyperemia of pulp tissue is accompanied ❖ by the same clinical manifestations as disturbance due to thermal ❖ shock. We find augumented sensitiveness to heat and cold, and a ❖ duration of pain not to exceed five minutes after the exciting cause ❖ has been removed. ❖ ❖

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"HOW OFTEN IS this condition of infection of the dentin overlooked ❖ or disregarded, so that after the beautiful inlay has been cemented, ❖ one cannot tell whether the painful sensation is attributable to ❖ thermal shock due to conductivity of the metal, or to toxins which ❖ have reached the pulp? ❖ ❖

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"IT IS CONCEDED that most deaths occur in very deep cavities, in ❖ which only a very thin layer of dentin has been left to cover the ❖ pulp. Can we always be sure that this dentin has been made sterile, ❖ and that we have removed all factors that may cause pulp degenera- ❖ tion? Can we always say certainly that death has been due to ❖ proximity of the metal, or that it was caused by an infection of the ❖ pulp that was in existence prior to cavity preparation? Is it not true ❖ that on removal of the inlay and after refilling the cavity with ce- ❖ ment we often still note a continuance of the symptoms? ❖ ❖

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"HOWEVER, is it not a great comfort to know that where the cavity has ❖ been properly prepared and an inlay cast so accurately that it does ❖ not need marginal burnishing to keep it from leaking, the death of ❖ a pulp is a great rarity. ❖ ❖

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"TO THOSE WHO are fearful of thermal shock it may not be amiss to ❖ mention that a thermal insulator is effective in direct proportion to ❖ its thickness." ❖ ❖

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BROTHER SORLEY seems to make a good point here. He has already ❖ reminded us that where we have pain after placing a gold inlay, ❖ and suspect that thermal shock is the cause, and we then remove ❖ the inlay and refill the tooth with cement, the painful symptoms ❖ often persist. Now then, his second postulate is that the thicker ❖ the insulator the greater the protection against thermal shock. Conse- ❖ quently, if the pain which began after setting the inlay with the ❖ thinnest possible layer of cement, persists after removing the metal ❖ and completely filling with cement, either thermal shock did not ❖ cause the trouble, or else cement is not an efficient insulator. 1923.

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LII.

IN THE PROCEEDINGS of the Round Table Club, reported in our October issue, Brother Kells propounded the following: "Here is the problem. A young girl of twenty, presents with an upper bicuspid containing a large and apparently satisfactory gold inlay. This tooth has never given the patient the slightest trouble. Skiagraph shows the apical area apparently normal. Question: By what means or test (other than clairvoyance) can one decide that the pulp is 'slowly dying?'"

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SOUNDED LIKE a catch question, when I first read it, and not desiring to be caught, did not attempt any solution of brother Kells's problem. Been wondering though who it was that told the patient that the pulp under a gold inlay in a tooth that was perfectly comfortable was "slowly dying." No one has come forward claiming to have made such a statement, and Brother Kells has not satisfied our curiosity as to why he propounded the query. Hence we all must abide in patience. Meanwhile, here is a discourse on the general subject by a Member from whom we are always glad to hear. Brother Henry Gillett, of Manhattan, replies to Brother Kells as follows:

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"MAY I OFFER A REPLY to Dr. Kells's question in the Round Table Talk, concerning a test by which one may decide that a pulp is slowly dying? It has been my experience that heat and cold are the best indicators in such a condition, to be applied as follows:

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"HEAT—Quietly, and, if possible, without the patient's observation, place within easy reach the Russell electric gutta-percha point, or the Russell tooth bleaching point, having first set the switch so that it will rather slowly raise the instrument to a temperature not usually bearable by a healthy tooth with a large inlay. Place the cold point against the inlay, slip the contact ring to close the circuit, and hold the point steady, watching for the first symptom of discomfort. If the indication comes very slowly, and not until the whole tooth is well warmed up, it will usually be found that the bulbous portion of the pulp is diseased, or dead. If the slowly appearing pain is acute

and persistent when it does appear, it often means that a small remaining part is vital and hyperemic, or congested. If there is a slowly appearing pain that does not become acute, it may be safely inferred that the whole pulp is in pathological condition, but with some living fibres persisting.

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"COLD—A small piece of ice held securely in 'mouse tooth' pliers, in contact with the inlay, or the tooth neck, is often helpful, when the heat test is inconclusive.

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"COMPARISON WITH the reaction of other teeth in the mouth, under the same tests, will serve to check the findings. It is often desirable to isolate the suspected tooth, from adjoining teeth, with the rubber dam, strips of matrix celluloid, or napkins, so as to prevent ready conduction of the temperature change to adjoining pulps.

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"BEFORE ELECTRICAL appliances were available, I used for years, a soapstone point in a crayon holder, for the heat test, but this has to be heated before applying, and it is difficult to keep it from the patient's knowledge that a hot instrument is to be used. This knowledge causes apprehension, and frequently leads to indications by the patient, due to psychological reaction rather than real pain.

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"A BALL of hot base-plate gutta-percha, impaled on the end of an instrument, is another possible and easy way of applying heat to an individual tooth. Response to thermal extremes, to slower than normal, is just as reliable an indicator of partial impairment, or partial loss of vitality, as overquick is of hyperemia and inflammation."

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IN THE DENTAL COSMOS for November, Brother Hyatt says: "The vast majority of children do not take good care of their mouths and cannot have regular polishing of all enamel surfaces. What is to be done with these cases?"

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WHAT IS TO BE done with these cases? Let us consider this query.

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BROTHER HYATT himself continues as follows: "Cement fillings have not proven a success in school work; at least not in New York. The majority of the cement fillings have washed out in a short time, so that we realize it is a waste of time and money to do it. This does not mean there are not a few cases in which the cement has lasted very well; but these cases are the exception, not the rule."

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THE FOLLOWING COMMUNICATION from Dr. Elmer Best deals with this same subject: "My observation of the incidence of decay on occlusal surfaces of molars and bicuspids in children, together with the difficulty experienced in cutting through the enamel had a definite effect on my clinical procedure.

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"THE ADVOCATION of preventive work as against therapeutic treatment has always appealed strongly to me. Further, my patients have come to expect it. As I go over those first permanent molars of the children in my practice, I feel a growing conviction that sooner or later caries will break out, in the occlusal fissures. However, I could not bring myself to cutting away the enamel. Viewed from Dr. Hyatt's standpoint, I admit this may be a weakness. Nevertheless I simply could not do it. The idea of using silver nitrate strongly suggested itself but I was unable to use it in satisfactory form.

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"AN APPEAL to my old friend, King Williams of Fort Wayne, brought forth results. He knew a chemical secret that I did not and got it up. He calls this Steridenf D. This material we have modified from time to time until in its present form it has been very satisfactory and its use extends now over a period of five years."

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DR. WILLIAMS'S METHOD is as follows: "With a large-sized, smooth broach, or medium apex curette, cleanse the fissure as thoroughly as possible. Then, using a stiff brush and porte polisher, scrub the occlusal surface, using peroxid. Wash off with warm water. Have patient bite into a bite tray, using modelling compound. Have bite cover molars and biscuspids. Chill and remove. Where compound was forced into the fissure, trim away slightly. Mix Steridenf D, and paint where you have cut away. Dry the teeth thoroughly and guide lower jaw, until teeth occupy their position in the bite. Have patient exert pressure with lower jaw. This forces Steridenf D, into all fissures. Hold for about a minute. Remove, wipe tooth carefully with gauze. Upper and lower teeth may be done in one operation. This material apparently crystallizes and fills the fissures permanently. I have many patients whose molars have developed no caries following this treatment for the past five years. My observation leads me to believe that had it not been done caries would have developed."

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IN THE NOVEMBER issue of the Dental Cosmos, Dr. M. L. Rhein likewise discusses the treatment of occlusal fissures in children. He says: "It is not so difficult to prepare cavities of this kind, but to

❖ fill them as they should be filled was no easy matter in the days ❖ when we filled those cavities. Today it is absolutely wrong to fill ❖ such a cavity, because the best kind of an operator could never ❖ restore the proper anatomical groove at the bottom of the sulcus in a ❖ filling. ❖ ❖

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"THIS WAS THE ONE great difficulty in filling morsal surfaces of all ❖ teeth, which was remedied by the wonderful invention presented to ❖ us by William H. Taggart when he introduced the cast inlay. Since ❖ the introduction of the cast inlay a filling of this kind is indefensible, ❖ because it never permits a tooth to function to its highest normal ❖ standard. This proper functioning is restored when the right kind ❖ of cast inlay is inserted. It is a surprise to me that this important ❖ point has been entirely lost sight of; that one cannot just cover ❖ the morsal surface with filling material without interfering with the ❖ normal functional activity of the tooth. ❖ ❖

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"NEITHER IS IT WISE to place temporary fillings in these teeth. Many ❖ of the profession lose sight of the fact that every time a tooth is cut ❖ into, the wound is reflected by a disturbance in the heart (pulp) ❖ of the tooth. An operation of this kind should be done once, and ❖ only once in the lifetime of the individual, when it is required, and ❖ this can be accomplished by cementing an inlay properly made."

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I HEARTILY CONCUR with Dr. Rhein's general proposition that the ❖ best filling in the occlusal surface of any tooth, child or adult, is the ❖ properly made, properly carved cast gold inlay. Nevertheless, this ❖ method does not solve the great problem, the care of children in a ❖ public clinic. Indeed it does not always solve the problem in private ❖ practice. There are innumerable instances where a proper gold in- ❖ lay could not be constructed at all; still others where it would be ❖ cruelty to the young child to undertake such work. Yet the solu- ❖ tion is really simple. ❖ ❖

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IN THE TEETH of very young and nervous children; in teeth partly ❖ erupted yet showing initial decay in the occlusal fissures; in occlusal ❖ fissures where the actual existence of caries is doubtful, but where ❖ caries is evidently menaced, judging by other teeth in the same ❖ mouth, I have had most satisfactory results with the silicate cements.

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DR. RHEIN'S CONTENTION that the old fashioned hammered gold ❖ filling cannot be made to imitate the correct form of the bottom of ❖ the sulcus is correct, but does not apply when we use a silicate ce- ❖ ment. Indeed the sulci can be restored more accurately and more

easily with silicate cement than with any known filling material. The technique is as follows:

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THE FISSURE SHOULD be cut out with the smallest possible rose bur, and, except at the actually decayed places, should not be made wider than would be produced with the next size bur. Where possible, the dam should be in place. In partly erupted teeth, cotton rolls and rapid work must be the resort. The silicate cement, should be mixed thoroughly and properly, and introduced rapidly, into an absolutely dry cavity. While the cement is still slightly plastic, it is modeled to conform to the occlusal contour, with a round burnisher which has been ground to assume a sharp, pyramidal form, the point of the pyramid nicely conforming the sulci. 1924.

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LIII.

IN DR. HYATT'S paper "Occlusal Fissures," which appeared in our ❖ July issue, speaking of various suggested treatment for fissures he ❖ says: "Dr. Ottolengui offers a solution which he thinks is simple, ❖ namely the use of silicate cement." ❖ ❖

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THIS BALD STATEMENT is almost a misstatement, and we are not sur- ❖ prised that in the discussion of Dr. Hyatt's paper, one gentleman ❖ should have alluded to this, asking for more information on the ❖ subject. ❖ ❖

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FROM DR. HYATT'S statement one might logically conclude that it is ❖ my common practice to fill fissure cavities with silicate cement. This ❖ is far from the truth. Yet Dr. Hyatt had a basis for what he said. ❖ Speaking of Clinics in which children are treated, either without ❖ charge, or at very moderate charge, I did say to Dr. Hyatt: "The ❖ solution of your problem may be found in the silicate cements." ❖ And this brings us to a differentiation between the exclusively ❖ therapeutic problem, and the one which likewise has a financial ❖ aspect. ❖ ❖

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I FIND MYSELF very much in accord with Dr. Jordon, when she de- ❖ clares that the best and most permanent treatment for caries in ❖ children, is the gold inlay, with the gold foil filling to be preferred ❖ in very minute pits and fissures. ❖ ❖

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I AM ALSO IN ACCORD with Dr. Rhein when he declares that every ❖ preparation of a tooth cavity is really a physical attack on that tooth, ❖ for which reason the cavity should be filled once, and once only. ❖

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BUT I DO NOT keep step with him when he argues that this must be ❖ done in all cases with the gold inlay. ❖ ❖

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SINCE I HAVE been innocently misquoted, I hope the Club Members ❖ will pardon my stating exactly what my position really is. In the ❖ presence of actual caries, in a fissure or elsewhere, in a child's tooth

I believe that a properly made gold inlay, inserted in a properly prepared cavity is the very best possible treatment.

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BUT I ALSO BELIEVE that there are exceptions to this rule, and that in pit cavities, such as occur at times in the facial surfaces of teeth, through defective calcification of enamel; in minute cavities at the ends of buccal grooves, grooves which are not fissures; in minute pits, at the crossing of sulci in which there are no fissures; in minute fissure cavities such as are at times found in upper bicuspids; in minute pits found in the mesial and distal sulci in lower bicuspids, where we often find a heavy ridge of enamel separating the two; in these and all similar situations I would use the cohesive gold foil filling, rather than resort to the destruction of healthy tooth substance which would be necessary to the proper preparation of a cavity, for a properly made gold inlay.

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WHERE THEN WOULD I use the silicates? As already stated, the gold inlay is advocated only in properly prepared cavities. Now there be many conditions and situations in which, I at least, cannot properly prepare a cavity, and properly insert an inlay, or a foil filling. A few of these cases may be mentioned. I find it often impossible to properly prepare cavities in the mouths of badly trained and refractory children; in children of highly nervous temperament with teeth inordinately sensitive; and especially in teeth which are only partly erupted, for which reason the use of the rubber dam becomes impossible.

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IN MY OWN work the rubber dam is a non-escapable prerequisite to the proper preparation of a cavity for an inlay, and for the proper insertion of an inlay. To those who will tell me that they can get along without the rubber dam, I make no answer, and courtesy prompts me to make no comment. I only can say that every man must do his own work within the limitations of his own ability.

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THIS IS NOT admitting that I have had no experience with keeping teeth dry with napkins, cotton rolls and the like. But we are not here discussing that.

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CONSEQUENTLY WE FIND, that at least within my own limited skill there are cavities in the occlusal (and other) surfaces of children's teeth in which I cannot insert a properly made gold inlay, or foil filling, in a properly prepared cavity. For the past several years I have been filling such places "temporarily" with silicate cement.

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TO MY AMAZEMENT, probably ninety per cent. of these silicate cement fillings, inserted for a temporary purpose, have been found adequate as permanent fillings; permanent, at least thus far.

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I WAS TEMPTED into this by observing the remarkably good condition of silicate cement fillings, in occlusal surfaces of molars and bicuspids, inserted by dentists in Europe, where this is a much more common practice than in this country.

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IT MAY BE STATED dogmatically that the silicate cements will be more durable in small cavities, in occlusal surfaces, than in any other cavities in the mouth. It follows therefore that in these situations we get the maximum service obtainable with this material.

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COMING NOW to the public, or the charity clinic, is it not useless to talk about the gold inlay, or the gold foil filling? Granting that with these we may assure the best results for the child, until some philanthropist endows a Gold Inlay Clinic, it is useless even to consider the gold inlay, as a therapeutic measure in public clinics.

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IT WAS FOR THESE reasons, and based upon the above recorded experiences, that I advised Dr. Hyatt, that in my opinion his best treatment for fissure cavities, in public clinics, would be the silicate cements. 1924.

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COMMENT. The added experiences during the years that have passed since the publication of the above renders me even more sanguine as to the utility of the silicates in the places and under the conditions enumerated. 1928.

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LIV.

IN THE EDITORIAL which appeared in the November issue of this magazine, a doubt was raised as to the possibility of apical infection resulting from pressure anesthesia. While the subject is fresh in our minds, we are glad to have received a communication from Dr. Norris C. Leonard of Baltimore, which reads as follows:

"I HAVE JUST READ the Editorial in Dental Items of Interest entitled, 'Pressure Anesthesia in Pulp Removal,' and I am reminded of my closing remarks, after the discussion of my paper at Cleveland. So far as I know, this was the first utterance of this doctrine, which is unquestionably sound, and is borne out by careful clinical observation."

THE PAPER ALLUDED TO was a very excellent one, entitled, "Partial Pulp Extirpation, in Children's Teeth," and was read before the American Dental Association, at Cleveland, by Dr. Leonard. There was an animated discussion, and in his closing remarks, Dr. Leonard expressed his views on the danger of apical infection as a result of pressure anesthesia, which the Secretary is sure that the Club Members would be glad to read. Dr. Leonard expressed himself as follows:

"AS TO PRESSURE ANESTHESIA, I feel perfectly confident myself that there is very little danger of forcing pathogenic organisms through the pulp into the canals, and up into the apical area. How would we do it? You may say that it goes into the blood vessels. How? It must go through the walls of the blood vessels and be filtered through the pulp tissues to the apical area. Suppose it went into the blood vessels. Why would it stop in the apical area? The blood vessels grow larger there all the time. It would go farther into the general circulation rather than stop in the apical area. Pathologists and bacteriologists who experiment a good deal with pathogenic organisms make their sterile fluids by passing tap water through a stone filter. The bacteria have certain physical qualities that prevent their passing through this filter. It seems to me that the pulp itself would make a much better filter than that. That is

aside from the question, however, and is in answer somewhat to some of the points made by the discussers, and also as a suggestion to someone who may care to experiment and work out a problem that has not been solved up to the present time. There is a wide belief among those who are considered authorities, that these bacterial elements may pass through the pulp tissue and into the apical areas and infect the tissues there. I think what happens is that these bacterial elements that get into these areas after the extirpation of the pulp are taken there with instruments, usually during meddlesome and unnecessary after-treatment. You can hardly exclude the possibility of an infection by that route. It would favor an implantation of these bacterial elements at a very suitable place for their culture and would interfere with the success of the operation."

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DR. LEONARD'S CONTENTION seems very logical and very reasonable. He very properly asks, "How would we do it?" meaning "how would we cause infection at the apex, by using pressure anesthesia?" If the capillaries have not been torn, then, as Dr. Leonard says, the bacteria must enter through the walls of the blood vessels. Granting that bacteria could do this, would it be accomplished within the few minutes during which pressure anesthesia is being applied, and would pressure, per se, be an instigating cause? The assumption seems ridiculous. But you will say, "Well, but bacteria do get into the blood stream?"—Yes, but not within five minutes, nor ten, and not because of pressure. When bacteria enter the blood stream it is by a slow process, and is one of the accompanying phenomena of infection.

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THIS LEADS to the postulate that when apical infection is observed after pulp extirpation, if the infection has not been carried to the apex on septic instruments, a possibility which Dr. Leonard very properly considers, then one may be sure that the pulp, although alive, was already infected before extirpation was undertaken, and apical infection already inaugurated prior to the application of pressure anesthesia, and consequently was in no sense related thereto.

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THE SECRETARY would like to suggest a line of possible research in regard to pressure anesthesia.

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HOW IS THE anesthesia produced? Does anyone know? If anyone does will he kindly step forward and elucidate? Is the anesthesia produced by some physico-chemical action of the agent, cocain let us say, upon the nerve fibres? If so, does anyone know just what the action is? If this be the explanation of the desentization, that is

❖ to say a chemical action of the drug which inhibits the transmission ❖ of pain by the nerve fibres, which, in a broad sense seems to be true, ❖ can it be claimed that the cocain solution must enter the blood ❖ stream to produce this effect? Would it not suffice that the drug ❖ should be brought into contact with the nerve terminals? ❖ ❖

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IF IT IS NOT necessary for the solution to enter the blood stream, how ❖ are the bacteria to be carried? Certainly it cannot be claimed, that ❖ one or more bacteria, lying in close apposition with an exposed pulp, ❖ would be instigated by pressure, to dart forward, like a terrier dog ❖ seizing a rat, and bite its, or their, way into the pulp tissue. Probably ❖ no one would advance any such preposterous hypothesis. ❖ ❖

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THOSE WHO BELIEVE in this theory of transmitting infection by apply- ❖ ing pressure anesthesia, must, as Dr. Leonard says, think that in ❖ some manner the bacteria become immersed in the solution and ❖ travel with the solution into the blood stream. But how? Dr. Leon- ❖ ard has already refuted the idea that bacteria may enter through the ❖ walls of the blood vessels, but he overlooked the fact that the sur- ❖ face of the pulp is often injured and the capillaries lacerated, so ❖ that there is a hemorrhage from the pulp. The ends of the torn ❖ blood vessels being exposed, can these become the gateways of ac- ❖ cess by the cocain solution, which perhaps has become contaminated ❖ by bacteria? ❖ ❖

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LET US CONSIDER THIS. If bacteria could pass through the vessel ❖ walls, thus finding their way into the blood stream, naturally they ❖ would travel with the blood stream, because its flow has not been ❖ interfered with. But aside from the fact that this could not occur ❖ so rapidly, as during the application of pressure anesthesia, Dr. ❖ Leonard very aptly asks why the bacteria should leave the blood ❖ stream at the apex, rather than to continue onward. ❖ ❖

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IF THE PULP has been intentionally and more fully exposed, as is com- ❖ monly done to hasten the anesthetic stage in the procedure, the ❖ laceration of the capillaries presents open ends of vessels, into which ❖ the unthinking mind might imagine that the bacteria could enter ❖ and travel with the blood stream. Such a man overlooks the fact ❖ that when a capillary is cut across the natural flow of the blood is ❖ interfered with. From one ruptured end of the broken capillary, ❖ the blood is flowing outward, and consequently bacteria cannot enter ❖ there and travel with the stream. In the other part of the capillary ❖ the normal flow of the blood has ceased, because the flow of the ❖ blood is dependent upon the pressure behind. This having been

❖ interrupted, we have this state of affairs; from one end of the torn ❖ capillary the blood is freely flowing outward, because of the normal ❖ pressure behind it; while at the other end the blood is slowly oozing ❖ outward, because there no longer is any blood stream pressure to ❖ force it onward. Hence at neither terminal of a torn capillary can ❖ bacteria enter and flow with the blood stream. ❖ ❖

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THE ABOVE REASONING may be altogether erroneous. The Secre- ❖ tary admits that it merely expresses conditions as he sees them. ❖ Perhaps bacteria may enter a torn capillary and progress apex-ward, ❖ against the stream, just as spawning trout and salmon swim up stream ❖ against the rapids. Is it possible to determine this? ❖ ❖

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AS WE DO NOT consider bacteria capable of "swimming" against the ❖ stream, like trout, any more than we can think of them as "biting" ❖ pulps as dogs bite rats, we are forced to consider them as being ❖ carried to the apex if they reach there at all. If carried, they must ❖ be carried by the solution. This in turn assumes that the cocain ❖ solution itself reaches the apex. But does it? ❖ ❖

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IF WE MAKE a solution of cocain on a mixing slab, and then leave it, ❖ in due time the water of solution evaporates, and crystals of cocain ❖ can be discerned on the slab. Suppose then, that upon removing a ❖ pulp under pressure anesthesia, we should place it upon a micro- ❖ scopic glass slide, and allow it to dry out. Would it be possible to ❖ discern, with a miscroscope, the cocain crystals deposited in or upon ❖ the pulp, by evaporation? If so, a good observer could report to us ❖ to what extent the cocain solution actually enters the pulp, and ❖ especially whether or not it enters the blood vessels. ❖ ❖

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WILL SOME CLUB member undertake such a research, and report? ❖ Thanks! 1924.

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LV.

HERE IS A LETTER dealing with a phase of the focal infection problem. We hear so frequently, and so emphatically of metastatic disease cured by tooth extraction, that it presents a new angle to have this type of cure questioned. The letter comes from our highly esteemed member, Dr. William C. Speakman, of Wilmington, Delaware.

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"IT HAS BEEN MY GOOD, or ill fortune, to be on a hospital Staff for the past few years. Every now and then I am called by one, or another, of the doctors, who wishes me to examine the mouth of some patient, who may be confined to the hospital for any one of a number of ailments; and upon examining the mouth I commonly find teeth that appear to have been treated, and the radiographic films, when taken, disclose the usual radiopaque areas about the apices. Then the question of extraction comes up.

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"I PUT IT SQUARELY up to the Staff, a few weeks ago, to declare frankly, whether or not we have obtained beneficial results from the removal of teeth, shown to be suspicious in the radiographs, or by opening and treating such teeth. And the Staff have generously passed the question back to me to find the answer.

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"THE ONLY WAY IN WHICH I can present my hospital confreres with evidence that would be worth while is by asking some of my friends to tell me what their experience has been. I know that you are very busy, and I shall not ask for a dissertation on this subject, which has been batted around, pro and con, for so long a time. But, can you tell me in a short note—'are we really getting anywhere with wholesale extraction of teeth, or by opening and treating their canals?' The latter course, as you know, is a long drawn out procedure, which entails a deal of expense upon the patient in private practice, and in a hospital, it means a lot of hard work if it happens to be a ward case. I should like to present to our Staff the best advice that I can obtain, and shall thank you for a reply."

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MY UNDERSTANDING IS that Brother Speakman would like his Colleagues to advise him as to how to answer the Hospital Staff,

❖ when the question is asked: "Shall we extract, or treat these teeth?"
❖ And the question, in this form is presented to our Members for
❖ frank discussion. Perhaps the reply that was sent to Brother Speak-
❖ man, may further excite interest in the topic, and inspire others to
❖ express their views. I wrote as follows: ❖ ❖

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"THE QUESTION WHICH you present is one of intense interest, and
❖ one to which the true answer is not known. ❖ ❖

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"THE FOCAL INFECTION PROBLEM is a double puzzle. First, it has
❖ been declared that apical disease causes distant systemic lesions. I
❖ think there is no doubt that it may, and that at times it does. The
❖ great difficulty is to know, in advance, whether a specified tooth will
❖ or will not produce a metastatic disturbance. ❖ ❖

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"SECOND, IN THE PRESENCE of systemic disease, complicated by in-
❖ fected teeth, does the removal of the teeth, or the treatment of the
❖ same, aid in a cure? ❖ ❖

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"WHEN A CASE clears up after extraction, or after the removal of apical
❖ infection, the attending physician and dentist frequently proclaim
❖ that this proves that the focal infection had been the etiological
❖ factor in the disease. But this is not sound logic. ❖ ❖

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"CONVERSELY, when no improvement results from extraction or treat-
❖ ment, the focal infection zealot says, 'Oh! Well, the extraction or
❖ treatment was too late. The lesion was too far advanced.' ❖ ❖

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"NOW, YOU ASK for my opinion, and you must accept it as an opinion
❖ only. I do not pretend to know. ❖ ❖

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"MY PRESENT VIEW is that much, if not all, depends upon the patient's
❖ vital resistance. If the vital resistance is high enough, apical infec-
❖ tion does not cause a metastatic lesion. If the systemic disease is
❖ already present, and the vital resistance is low enough, tooth extrac-
❖ tion does not effect a cure. ❖ ❖

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"HOWEVER, IN THE PRESENCE of systemic disease, complicated by
❖ an apical infection, it would seem rational to believe that the removal
❖ of the focus, would be of advantage to the patient, by reducing the
❖ 'load,' and thus rendering the vital resistance proportionately higher.
❖ Putting this theory into practice my procedure would be as follows:

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"I UNDERTAKE to treat and retain diseased teeth, when there is a

reasonable prospect of eradicating the infection, provided the patient is in sound health, believing that such a course will not be detrimental. But in the presence of systemic disease, of a type classified as being of infectious origin, I would take no such chances, even though I might personally doubt that the tooth were a causative factor. A chronic systemic lesion is of itself evidence of an insufficient, or inefficient vital resistance."

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THE ABOVE ARE slightly modified forms of the letters from and to Brother Speakman. I should like here to add, that to the last stated rule, there might be, and are, notable exceptions, where, guided by the exigencies of the case, and the unusual value of the teeth involved, the dentist would be justified in attempting to treat and save the teeth, even in the presence of systemic disease. In such case every precaution should be taken, by frquent radiographic and other examinations, to make sure that the focal infection really had been eradicated.

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THE MAXILLARY INCISORS in the mouth of an opera singer would be so important, that one might better attempt a cure by surgical removal of the apex of the tooth, rather than by the surgical removal of the entire tooth. Yet, after all, the heart, even of an opera singer is of more value to her than an incisor tooth. They say that "dead men tell no tales;" neither do they sing either.

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JUST AS WE GO TO PRESS a reply has been received from Brother Speakman, from which the following extracts are taken because they seem of value in our consideration of this subject. After acknowledging my letter, he records a few cases, such as had tempted him to write in the first instance.

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"A PATIENT AND FRIEND, telephoned asking me to go to his home, as he was confined to his house. I found him all crippled up in the legs. His physician had given him orders to go to Philadelphia to see a certain man, and to have his teeth radiographed. Then he was instructed to have extracted every one which showed apical infection. My patient was 'up in the air.' 'Why,' said he, 'I don't want to lose my grinding teeth, and besides there is one front tooth. Take me to the best dental man you can find.'

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"WE MANAGED TO GET to Charlie Turner's plant, and we consulted Dr. Prinz, who said: 'I would go slow on extracting. Open those teeth and treat them, one or two at a time, and watch your case.'

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"BEFORE WE COULD do this the patient telephoned early one morning and said: 'The pain is all gone. I am starting for the marshes and duck shooting this afternoon.' This he did. The teeth were not touched, and the arthritis has never returned.

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"THE NEXT CASE was a foot. In the old days we would have called it gout. Central and lateral incisors affected. Teeth treated. Arthritis disappeared. In a third case, there also was arthritis. One lower bicuspid capped with gold. Root appearance not very bad. Opened, treated not expecting results, yet pain disappeared.

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"IN A FOURTH CASE the patient was in the hospital. Forty years old, arthritis, and bad heart. All teeth extracted. No improvement."

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THOSE OF OUR CLUB MEMBERS who may doubt the possibility of systemic disease, as a distant reaction of an apical focus of infection, are urged to read the excellent article in this issue by Dr. Russell L. Haden. The author very properly calls attention to the inadequacy of the evidence often adduced as proof of the causal relation between foci of infection and systemic disease. Yet in connection with his own most significant experiments he says:

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"CERTAINLY THE BEST PROOF we have of the etiologic relationship of a focus of infection to a given lesion, is the reproduction in animals, of the lesion from which the patient suffers, by the intravenous injection of bacteria recovered from the patient."

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THIS MIGHT BE AS NEARLY sound proof, considered logically, as we may hope to get, even though it be a fact that intravenous injection of bacteria is not absolutely analogous to the process alleged to occur in the body. But we have never understood that the bacteria, actually recovered from the patient, have been used in this type of experimentation, either by Rosenow, or by others. Indeed Dr. Haden himself goes on to say:

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"THE SUCCESS OF ATTEMPTS to reproduce lesions in animals, depends primarily on the use of proper culture mediums, in which the specific affinity is retained during the period of incubation, and the rapid transfer of organisms from the patient to the experimental animal."

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AN ANALYSIS of the above statement brings us the following deduction: If the experimentor reproduces the specific lesion in the ex-

perimental animal, he concludes that his postulate has been sustained. If, however, he fails to reproduce the expected lesion, either his culture medium was wrong, or his technique faulty. At least thus it seems, to a mind not thoroughly trained in the study of these very microspic organisms which apparently have many vagaries in the selection of their "affinities."

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PERSONALLY, I MUST CONFESS that I shall be far more satisfied as to the logic of these conclusions, when the experimentors begin making their injections via the pulp canals of their animals, rather than intravenously.

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SOME WIT, or was it a Half-Wit, has said: "You say that if you inject 5 c.c. of a pure culture of a Streptococcus into the veins of an animal, he will get sick? Well, why shouldn't he?"

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NONE OF THESE possibly unscientific comments are intended to detract in any way from the value of Dr. Haden's work, which is heartily commended.

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AND NOW WE HAVE still another communication on this general subject. Not from a bacteriologist, nor an interne this time, but as one might say, from "the man on the street," said man being a dentist, and a member of our Club; Dr. T. A. Leach, of Hutchinson, Kansas. I rather think that Dr. Leach meant this for poetry, but if one reads carefully he will see that there is more prose than poetry in the views expressed. Anyway here is how Dr. Leach phrases it:

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"If you're feeling down and out, it's the teeth.
If your big toe has the gout, it's the teeth.
If you're feeling sort of blue, 'cause your stomach's out of true,
and you don't know what to do, it's the teeth.

"If your liver isn't right, it's the teeth.
Your complexion is a sight? It's the teeth.
If you're feeling dull and worn, when you get up in the morn,
and your world seems all forlorn, blame your teeth.

"If you seem to have no pep, it's the teeth.
If you've lost your springy step, it's the teeth.
You're so nervous, it would seem, that you almost have to scream,
from the pains with which you team? It's the teeth.

"If your baby has the colic, it's her teeth.
If she doesn't play and frolic, it's her teeth.
If she keeps you up at night, if she screams with all her might,
'cause digestion isn't right, it's her teeth.

"All your trouble may be local, on your teeth.
But if apical, it's focal, on those teeth.
Are you troubled with neuritis? Epilepsy, or phlebitis? Or perhaps conjunctivitis? Ray the teeth!

"If you've trouble in your attic, it's the teeth.
If your mind is most unstatic, it's the teeth.
If your muscles feel rheumatic, and your pains are most emphatic,
settling down in your sciatic, pull some teeth." 1925.

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LVI.

THE GOOD FELLOWS Around the Table may be interested in a some-
❖ what peculiar experience that their Secretary has just had. I was
❖ honored by the President of the Dental Society of the State of New
❖ York, by being appointed Chairman of the Committee on Scientific
❖ Research. As the Report of this Committee is to be presented at
❖ the meeting in Albany, in May, it would be manifestly improper
❖ to record its contents at this time. ❖ ❖

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AS AN INTRODUCTION to the peculiar episode above mentioned,
❖ however, it may not be amiss to state that the research, or perhaps
❖ we should better say the investigation, related to the success, or fail-
❖ ure which dentists meet with in the use of amalgam. Perhaps also I
❖ may be permitted to state that the report will not be greatly in favor
❖ of amalgam, as it is used. Not as it might, could, or should be used,
❖ but as it is used. This I think brings us nicely to the incident. ❖

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A NEW PATIENT PRESENTED today, and at the outset made a state-
❖ ment somewhat as follows: "I am afraid you will not find me a
❖ very desirable patient, because I am rather particular about how my
❖ work is done; or rather I should say, I want it done in the manner
❖ that I know is best for my own teeth." ❖ ❖

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IT IS SCARCELY NECESSARY to transcribe this in the form of a dia-
❖ logue, and I will save time by just recording the main points made
❖ by this patient. ❖ ❖

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"MY FIRST PECULIARITY," said he, "is that I never allow any gold
❖ in my teeth. Amalgam is best for me. I did have a dentist once
❖ who insisted in filling several of my teeth with gold. Of course
❖ these fillings failed. I knew they would, because my teeth are too
❖ soft for gold. Well, then I got another dentist, and I had my own
❖ way about it. I made him patch those leaky gold fillings with
❖ amalgam, and just see how good they are now!" ❖ ❖

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THIS GAVE ME THE FIRST opportunity to examine his mouth, and I
❖ found that both of his lower first molars were filled with gold, but

❖ that the first dentist evidently had not cut out the fissures to the four ❖ ends of the cross, and, when caries recurred in the ends of the ❖ crossed fissures, the patient, as he said, had had his own way, and ❖ we were presented with the anomaly of gold fillings with the four ❖ extremities of amalgam. Where the decay supervened in the un- ❖ filled extremities of the fissures, the second dentist, at the behest ❖ of the patient, had prepared tiny cavities and filled them with ❖ amalgam. ❖ ❖

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THIS SHOULD interest our Odontotomist member, Brother Hyatt. ❖

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"LOOKS GOOD, EH?" remarked my patient, after I had seen his amal- ❖ gam-tipped-gold fillings. "I'll say they do! And look at this amal- ❖ gam filling in my lower bicuspid? Some large filling that, and the ❖ pulp still alive, and no stain showing through the tooth. Been there ❖ fourteen years. You notice that? Very well. Now look at this one ❖ on the other side, in my second molar. My skillful dentist died, ❖ and this was put in by one of your up-to-date, latest-style-in-dental- ❖ education, dentists. Slap-bang, Hurry-worry! Next patient wait- ❖ ing!—Shoo, Shoo, come again tomorrow! Good bye! He filled ❖ my tooth with amalgam, but how did he do it? Cavity prepared ❖ with a few whirls of his drilling machine; no rubber dam; couple of ❖ napkins stuffed in my mouth and held with a clamp. Hot air ❖ syringe by the office Nurse, while Mr. Dentist mixed his amalgam. ❖ Then, bang! In she goes! Right against the naked surface of the ❖ tooth. Not a particle of cement to protect the tooth from metallic ❖ stains, and to save the pulp from—what do you call it? Oh yes! ❖ Thermal shock! So what could you expect? Filling did not last ❖ a year. Decay crept in and undermined one wall, till part of it ❖ broke away. Tooth uncomfortable all the time. Have to stick my ❖ tongue over it to swallow hot coffee. And ice cream? Just let it ❖ touch that tooth, and—Oh Boy! All right, Doctor. Here endeth ❖ the lecture. Do whatever you want, but remember I am wise to ❖ dentistry. I know that it is the cement, not the gold inlay that ❖ saves the most teeth. Excuse my being so chatty. Will you ❖ please?" ❖ ❖

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AS THEY SAY ON THE MOVIE SCREENS, "End of Episode 1. ❖ Episode 2 will follow next week." Only the elapsed time was not a ❖ week, but just one single hour, when another new patient came in ❖ and asked me to remove all the amalgam fillings from his mouth. ❖ It seems he is suffering from a mysterious low grade septicemia. ❖ Feels quite well in the morning. Loses his vital energy as the day ❖ progresses, and has a slightly abnormal temperature at night. Doc-

❖ tors having failed to locate the cause, advised him that: "It must
❖ be his teeth." Radiographic survey proving negative, the Doctors
❖ were and are puzzled. ❖ ❖

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"NOW, DOCTOR," said the patient, "I reason it out this way. Those
❖ Doctors know their business. I have had every sort of physical
❖ examination without finding the origin of my infection; I say infec-
❖ tion because that is what it is. Or poisoning maybe. Finally my
❖ Doctors declare the trouble must be in the teeth, and I believe they
❖ are correct. More so than they know. They said the trouble is
❖ 'in the teeth' when really they meant 'on the teeth'; diseased roots
❖ you know. Now I think the trouble is 'in the teeth' not 'on the
❖ teeth.' I think it is the amalgam fillings." ❖ ❖

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ASKED WHY, he continued as follows: "Well, I have dabbled a little
❖ in chemistry, and I have watched different dentists mixing amalgam.
❖ Some get the stuff so wet, it would almost run. Most of them mix
❖ it too thin, and have to use a piece of chamois and a pair of pliers
❖ to squeeze out the excess. Stands to reason, does it not, that you
❖ can't get a definite proportion of mercury and the filings, working
❖ in that way, now can you? You cannot. Very well, what becomes
❖ of the excess mercury? ❖ ❖

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"NOW, DOCTOR, excess mercury is right. I have looked this up, since
❖ I got the idea. Just look in your books and what will you find?
❖ That in any amalgamation, the mercury will remain in stable com-
❖ bination with metals, only in a given proportion. Any excess of
❖ mercury sweats out; a sort of globular osmosis, until the stable pro-
❖ portion is reached. In plainer language, only a given quantity of
❖ mercury will 'stay put' with a given quantity of other metals. All
❖ right then! What becomes of the excess mercury that sweats out
❖ of these amalgam fillings? Just seeps into the system, does it not?
❖ I'll say so! Please take out all the amalgam and put in gold inlays."

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THIS BELIEF held by this patient is by no means new. When amalgam
❖ was first introduced, this argument was rampantly advanced. True,
❖ millions of amalgam fillings have been placed since then, and so
❖ far as we know, no harm has been done. But then, before we heard
❖ of focal infection, millions of roots, filled nearly but not quite to
❖ the end, "gave no trouble." So perhaps this excess mercury proposi-
❖ tion is worth thinking about. Research Commission of the A. D. A.
❖ please take notice. ❖ ❖

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IN CASE THE A. D. A. Committee on Dental Research, or any similar

body should care to undertake an investigation of the possible dangers from amalgam fillings, because of the mercury content, a beginning might be made by consulting the Dental Register for January, 1872, where will be found a report of a case of death attributed to poisoning from mercury in an amalgam filling, the Coroner's jury bringing in a verdict to that effect.

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IN THE SAME VOLUME, of the same journal, or in the Periscope of the Dental Cosmos, for 1872, page 329, may be found a discussion of this case by Dr. S. P. Cutler. Dr. Cutler declares that the verdict was not sound; that the man could not have died from mercurial poisoning from the quantity of free mercury in a filling; that if the origin of his trouble was the tooth, it was probably because of death of the pulp and alveolar abscess. Thus early was the possibility of serious results from apical infections recognized. Dr. Cutler himself made some experiments, from which he reported: "According to my experiments with amalgam, 24 grains of the filling (filings?) unite with 15 grains of mercury, and lose 2 grains by evaporation." This he argues could not produce salivation. Probably not. But might it not have other deleterious effects, which might be aggravated by the continued use of amalgam in the mouth?

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THE QUESTION of the possible dangers from amalgam fillings was revived, by Dr. E. S. Talbot of Chicago. Dr. Talbot published a paper in the Ohio State Journal of Dental Science, January, 1882, entitled "The Physiological Action of Mercury as Used in Amalgam Fillings," in the course of which he says: "Mercury taken into the system in small quantities long continued, manifests itself in a variety of ways. The digestive apparatus is involved, with a loss of appetite, nausea, vomiting and frequently pain and tenderness of the stomach. The bowels are loose and often there are bloody stools."

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IN THE WORKS on toxicology, the poisonous effects of mercury are usually described as the result of fairly large doses, though some authorities do mention that individuals having a special antipathetic reaction to mercury, might suffer from small doses long continued. With what we know now of the usual logical soundness of Talbot's research work, it might not be amiss at all to read this old paper and weigh his arguments, and perhaps experiment along the lines indicated. Might it be possible that some of our systemic diseases, now attributed to focal infection, may be traceable to a low vital resistance engendered by a subtle if symptomless mercurial poisoning?

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ONE CANNOT EVEN THINK of amalgam without recalling to mind Dr. J. Foster Flagg, who, more than any other man, established the use of amalgam as a sound practice. Flagg immediately "threw his hat into the ring," and "went for" Dr. Talbot.

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FLAGG'S COMMUNICATION appeared continuously in four issues of the Dental Cosmos for 1882. He violently attacked and ridiculed Dr. Talbot's arguments. As an example of cutting sarcasm the following quotations are worth repeating. He himself quotes one of the experiments reported by Talbot, as follows:

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"AN AMALGAM FILLING was placed at the base of a sensitive plant. In four days the extremities of the leaves were dry and brittle, and at the end of ten days, notwithstanding care and nourishment the plant died. Ergo: amalgam is not a good material with which to fill teeth."

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IN ORDER TO DISCREDIT this type of argument, used by Dr. Talbot, Flagg utilizes the **reductio ad absurdum** method of discussion. He replies as follows:

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"IN THE YEAR 1879 a favorite cat died and was placed at the "base" of an unpromising Concord grape-vine, which has since been plentifully supplied with manure-water. The result is gratifying in the extreme; luxuriant growth has been attained with bountiful return of fruit, which, though grown on Concord stem, has a delicious Catawba flavor. Nothing could be finer or more satisfactory. Ergo: dead cat, either soft or cohesive, is good material for filling teeth; and for assuring continuously satisfactory results, the mouth should be rinsed frequently with manure-water."

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IT WOULD SCARCELY seem needful to test out Dr. Flagg's suggestion practically. But it might be advantageous to once more consider the problem, outlined by my patient: "What becomes of the excess mercury in amalgam fillings?"

1925.

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LVII.

HERE IS AN INTERESTING letter from Dr. Van F. Barnes, of Glenwood, Iowa, who writes as follows:

"IT HAS BEEN MY OPPORTUNITY and pleasure to be associated with a man who practiced dentistry in this community for fifty years. He is a Past Secretary and President of the State Society, and has served on the Examining Board.

"HE HAS, and so far as I am able to judge has justly, a wonderful reputation as a plate man. Last year two patients came all the way from California, one from western Nebraska, and one from South Dakota, to be fitted with plates. Now, this gentleman has never used anything but a plain-line articulator.

"A FEW MONTHS AGO a prominent citizen of ours, while visiting in a nearby city, had a set of dentures made by a man so prominent in this class of work, as to cause me to hesitate in naming him. These dentures were of course set up in accord with approved modern articulation methods. Despite this fact, however, the patient was not satisfied.

"ENTER NOW our out-of-date doctor (note the small 'd') with his 'barn door hinge'; result a satisfied patient.

"WHICH ALL LEADS me to ask, is plate work an art, or a science? Do articulators play as important a part as has been claimed and thought? After all the labor connected with an anatomical articulator, why, if it is worth while, can not the patient appreciate it? In matters of surgery, the patient, of course, has no basis for judgment, but in the judging of the comfort with which he wears his plates, is not his opinion worth more than ours? Is plate work as a class, any more satisfactory today than it was twenty-five years ago?

"NOW, MR. SECRETARY, I am asking for your opinion, from an honest desire to get at the truth of this proposition. I do not wish to

appear to air my vast intelligence, but I do express my humble opinion that the success of the old Doctor (large 'D' this time), rests on the fact that he uses the jaws of his patient for his final articulation, and where could you find a better articulator?"

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THE SECRETARY CHEERFULLY answers the query propounded. Question is, "How can you find a better articulator than the patient's own jaws?" Answer is, "You cannot!"

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IT MAY NOT SEEM SO AT FIRST, but here we are once more in contact with the two rival schools of practitioners. Those who operate by the direct method, and those that prefer the indirect. When we take an impression of a cavity, make an amalgam die, and use an articulated cast of the opposing teeth as a means of carving our wax pattern to proper occlusion, we operate by the indirect method. We depend upon replicas of the natural parts, assembled in spite of all the obstacles of incorrect bite, expansion and contraction of materials, etc., etc., to obtain our final result, and then often it is not final.

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THE MAN WHO FOLLOWS the original directions of Dr. Taggart, makes his wax pattern in the cavity which it is intended to fit; not in a duplicate of it. He carves his contact and occlusion by the natural organs, used as that particular patient uses them; not by a plaster or other model of these teeth, articulated with the aid of a piece of wax, that the patient is requested to bite into. This is the direct method.

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IT IS EXACTLY THE same when we construct dentures. If we intend to rely mainly upon the patient's own jaws for the final adjustment of the occlusion, why then almost any old articulator will serve. Not alone the hinge joint apparatus, but even the much older method of building an extension of plaster, at the rear of the cast of each jaw, in one of which is imbedded a couple of small wire nails, which enter holes in the other. These were not really called "articulators," but merely "guides."

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OF COURSE these "guides," being immovable, because of the nails, did not register the condyle path, nor indicate the curve of Spee, supposing that the patient had such a thing about him. But one could, with fair acccuracy, determine the approximately correct length of the incisor teeth. The bicuspids and molars could then be arranged just in an approximate manner, and the operator was ready

❖ to see his patient, and to correctly articulate the artificial teeth into
❖ an adjustment that would supply functional occlusion. ❖ ❖

✣ ✣ ✣

AND I WILL VENTURE to say, that a man skilled in this method, and
❖ conscientious in its application of it, can provide a better functional
❖ occlusion, than can be produced with any, or all, of the scientific
❖ articulators now on the market. ❖ ❖

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INDEED CAN IT NOT be said with truth, that the constant improve-
❖ ments being made, even unto this day and by this generation, proves
❖ conclusively, that the articulator has not yet been produced that will
❖ register the movements of all human jaws with absolute accuracy?

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IS IT NOT LIKEWISE true that the man who uses the direct method of
❖ articulation, the man who sets up teeth and arranges his occlusion
❖ in the mouth of his patient, guided by the movements of the patient's
❖ mandible, always and invariably has an "accurate articulator?" ❖

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LET IT NOT BE supposed that these views are original, or that they are
❖ based upon much personal experience. Rather are they based upon
❖ fifteen or more years of observation. Observation of the work of
❖ Dr. Norman W. Kingsley, who used no articulators at all, depending
❖ entirely upon his "plaster guides," and final adjustments with the
❖ patient present, and yet who was so successful in furnishing func-
❖ tional occlusion before the term was known, and before anatomical
❖ articulators were even thought of, that patients came from the North,
❖ from the South, from the East and from the West, to have him
❖ "make teeth" for them. ❖ ❖

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AN INCIDENT IS worthy of record. Dr. Bonwill, Dear Old Dr. Bon-
❖ will, called on Dr. Kingsley one day, proudly exhibited his new
❖ articulator, and presented one to Dr. Kingsley. ❖ ❖

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SOME MONTHS LATER, I said to Dr. Kingsley: "You never have
❖ used Dr. Bonwill's articulator! Why not?" And he replied: "Oh!
❖ It is all so nice and shiny, with its fine nickel plating, that I just
❖ hate to mess it up with plaster." I stared at him amazed, and he
❖ continued more seriously: ❖ ❖

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"BONWILL CLAIMS that he has discovered the geometry of occlusal
❖ and masticatory relation, and that he can register them with his
❖ apparatus. Scientifically and theoretically, he is no doubt correct.
❖ But remember this! Mathematics, Geometrics and Mechanics are
❖ all absolutely exact sciences, and there is nothing exact in human

beings. No two human beings, and not even any two similar parts of one human being, are identical. Bonwill may have discovered the fundamental principles of human occlusion, but he cannot with his apparatus, absolutely record the occlusal movements of the mandible of any single patient. It is the departures from the fundamental rules which apply to the species, that produces individuality. And it is for the individual that we make a set of teeth, not for the species as a whole. Therefore we must use the individual's own masticating apparatus for the final arrangement of his artificial teeth, if he is to enjoy their use."

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HAVING QUOTED KINGSLEY'S views as they impressed me, it may be of interest to explain exactly his method. His first rule was to make a gold plate that would fit. He never used vulcanite, during all the years of my association with him. And here was a good point that he demonstrated to me once. He said: "Dentists put in a set of teeth, and then grab them with two fingers and pull on them, to show the patient how strong the 'suction' is. But the patient never 'pulls' on his teeth. He 'pushes' on them. Hence your gold plate must fit, so that the patient can bite a lead pencil at any part of the plate without dislodging it. Then and not till then should you start setting up teeth."

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HAVING THUS STABILIZED his gold base plate, he then built up his occlusal rim, arranging the length of the incisors in accord with the lip line, and then he transferred his plate to his plaster guides, and set up his artificial teeth.

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THE PATIENT WAS then called in, and the occlusion examined. Any tooth which was manifestly "above" the occlusal plane, was removed from the wax, and placed in line. When the crude adjustments had been made, approximately correcting the occlusion, and definitely determining the most natural arrangement of the visible teeth, the teeth were attached to the gold base, with vulcanite, or by soldering, as had been planned.

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THESE PLATES WERE THEN again tried in, and the final occlusal adjustments made, by using carbon paper and grinding with small stones. Approximal articulation of the teeth in the mouth might occupy an hour, and the final occlusal adjustments, two hours. Can all the model making, condyle path recording and other requisites of modern anatomical articulators, be accomplished in less time? And are the results more accurate? 1925.

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LVIII.

THE EDITORIAL in our August issue has attracted a great deal of attention, no less than fifty readers having written briefly, asking for the technique of using chlorid of ethyl. Two or three quotations from these letters will suffice as an introduction to the general reply that the Secretary thinks is now in order.

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DR. VANCE HASTY, of Satesville, N. C., says: "I have had some experience with it, but patients did not seem to like it, and I discarded it. Please tell me how you use it. People still think painless dentistry a joke, and the average dentist is responsible for it. We need to practice for other people as we would expect dentistry to be practiced on ourselves."

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DR. J. M. WISAN, of Elizabeth, N. J., particularly asks, "Do you think that the spray has a deleterious effect upon the circulation in the vessels of the pulp." By the way of reply, I can only state that after over twenty years of experience with ethyl chlorid, I have never noted any ill effects.

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OF ALL THE OTHER LETTERS the most interesting comes from Peace River, Alberta, Canada, from Dr. L. G. Robinson, and it is quoted extensively because it rather affords an excuse for publishing a technique which has been given often, heretofore. Dr. Robinson writes as follows:

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"IN AN EDITORIAL, in your August issue, you refer to the use of ethyl chlorid spray for desensitizing sensitive teeth. Then you remark that 'The technique of using chlorid of ethyl need not be described here.'

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"DO YOU FORGET that many of your readers are not familiar with those bits of technique that, 'need not be described here?' Or is it that I am alone in the depths of abysmal ignorance, that I should so often be mystified by such remarks following omissions that may appear negligible to older practitioners, but which if described might mean so much to me?"

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DR. ROBINSON then recounts his dissatifaction with chlorid of ethyl for extractions, for which reason he doubts that a tooth could be desensitized by spraying the gum tissue. He then says:

"IT SEEMS TO ME that ethyl chlorid is mighty cold, and that if sprayed directly into the cavity the nerves of the pulp would receive considerable shock. Granting that this shock might not cause permanent injury, still I have visions of the patient vanishing through the ceiling when the spray reaches the seat of sensation. Hence I would greatly appreciate a detailed account of the technique of successful use.

"YOUR PUBLICATION is much appreciated by myself, and others of Northern Canada. I am practicing in the farthest north town in Alberta, and possibly in Canada, with the exception of the Yukon. Opportunities to attend conventions and study clubs are not very frequent, and we must rely largely upon magazines."

THERE IS NO DOUBT that it is the duty of all dental magazines to respond to demands of this nature, and, as far as possible, to supply postgraduate teaching, which, however familiar to the men in metropolitan districts, is yet new to men in distant corners of the earth. Hence the Secretary trusts that those familiar with chlorid of ethyl will pardon a description of its use.

ETHYL CHLORID is now supplied in a glass container, with a metallic outlet controlled by a set screw, which permits the direction of a very fine spray upon the tooth, or even directly into the cavity. It would be hopeless, as Dr. Robinson suggests, to control a sensitive cavity by using the spray over the root apex, and upon the gum tissue.

IT IS LIKEWISE TRUE, as he and others suggest, that the spray, aimed directly upon a sensitive cavity must produce considerable shock. But this may be very greatly minimized by the manner of use.

FIRST, I CONSIDER IT advisable, in all possible cases, to isolate the tooth with the rubber dam, as the spray is rather irritating to the tissues of the oral cavity, and especially if it should accidentally pass down into the fauces. Very great care must be exercised, that the spray should not accidentally strike the eyes. This is much more possible than might appear, due to the squirming of nervous patients, or to misdirection of the spray nozzle, when releasing the set screw. It is possible that no damage would be done, but the pain is intense,

❖ and a single such accident will convince both operator and patient,
❖ that ethyl chlorid spray should not enter the eyes. ❖ ❖

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AN EXCEPTION to the rule of using the rubber dam, is of all too fre-
❖ quent occurrence, where the cavity is at the labio-cervical margin, or
❖ similar situation. These cavities are usually partly below the gum
❖ margin, so that the rubber dam, and dam clamp, cannot be used at
❖ the first sitting, and it is at this first sitting that the cavity should
❖ be prepared. Let us then describe the technique for this difficult
❖ locality. ❖ ❖

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AS AN EXAMPLE, let us consider a lower cuspid, the lower teeth being
❖ more difficult than the upper to dam with napkins. Here we utilize
❖ the cotton rolls, a larger one on the tongue side and a smaller lying
❖ along the gum next to the cheek. These two rolls are held in place
❖ with a clamp that engages a bicuspid, or preferably a molar, the
❖ clamp gripping both cotton rolls. ❖ ❖

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THE TOOTH CAVITY is next dried out with bibulous paper, or spunk,
❖ followed by warm, not hot, air. The cavity is cleansed of decay as
❖ far as the patient will permit, and then a bit of cotton, dipped in
❖ ether, is gently placed within the cavity, or over it if the cavity will
❖ not retain cotton. The spray is then directed first against the unde-
❖ cayed portion of the tooth, so that the tooth is somewhat chilled in
❖ this manner before attacking the actual cavity. In a very few
❖ moments the spray is moved, so that it strikes the cotton, saturated
❖ with ether. Both applications of the spray cause some shock. As
❖ soon as this has somewhat lessened the cotton is removed from the
❖ cavity, and the spray is directed into the cavity proper. In spite of
❖ our precautions, in many instances, this will cause even more shock,
❖ but it will be very much less than if the application had been into
❖ the cavity in the first instance. ❖ ❖

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HAVING REACHED the cavity proper, the spray must be continued
❖ for a considerable length of time, if real painless preparation is to
❖ be attained. This detail of long application is so important that I
❖ cannot resist the temptation to narrate an incident, that will help to
❖ fix this into the minds of the Club Members. ❖ ❖

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DURING MY BOYHOOD in the South, of course we had negro servants.
❖ at one time we had a Small Boy, orphaned by the death of a Cook
❖ who had been in our employ. This Small Boy developed a strong
❖ habit of running away, returning after many days with all his clothes
❖ worn out. My Grandmother tried dressing him in girl's apparel,

❖ but this only restrained him until he could filch a pair of "pants." ❖ Finally the new Cook-Lady offered to cure the Small Boy, and she ❖ did. She had him stripped naked, his hands tied above his head ❖ and fastened to a beam in the woodshed, and then, under her direc- ❖ tions, the Butler proceeded to apply a stout strap. "Give him ten ❖ lashes," directed the Cook. This, William the Butler did. Then ❖ something like the following dialogue ensued. "Now Boy, is you ❖ goin' run 'way any mo'?" "N'm! N'm!" "You is sho' you an't ❖ goin' run 'way no more, none 'tall?" "Oh! Yes'm! I's sho'. Cross ❖ ma heart, and hope to die!" "All right den," said the Cook. ❖ "William, give him ten mo' lash." This was continued, the questions ❖ by the Cook and the protestations by the Small Boy punctuating ❖ each ten lashes, till an even hundred had been applied. After the ❖ release of the Small Boy, somewhat incensed, I asked the Cook, ❖ "Why did you go on lashing that Boy after he promised so many ❖ times to be good?" And she replied, "He done promised befo' ❖ an't he? So befo' we sta'ted I done figured, as how he got to have ❖ 'bout a hund'd lash to make him 'member his promise. I 'spects ❖ now I done cured him o' runnin' away." And she had. ❖ ❖

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JUST REMEMBER this story when applying ethyl chlorid, and when you ❖ think you have given enough, give some more; and then some more; ❖ and yet some more. These latter applications cause absolutely no ❖ pain whatever, and it is the length of the application that insures an ❖ operation so painless, that the patient forgets the earlier shock, and ❖ thereafter, will ask to have the spray used, despite the pain of early ❖ application. ❖ ❖

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CERVICAL CAVITIES may be treated as above described, and then ❖ thoroughly excavated, with no pain whatever. Indeed, the pain is ❖ so completely controlled, that the dentist must be cautious not to ❖ expose the pulp, from which he is customarily kept away by pain- ❖ ful sensation. These cavities then, may be tightly packed with ❖ temporary stopping, or cotton saturated with sandarac varnish, as ❖ the particular case may require, and the packing held in with a ❖ ligature. At the subsequent sitting the dam may be used, and a ❖ cervical clamp applied. If, upon examination, the cavity requires ❖ a little more preparation, for undercuts perhaps, the spray may be ❖ again applied, more easily than at the first sitting. ❖ ❖

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THERE IS NOT TIME here to enter into a discussion of the psychic ❖ side of this treatment, but it is quite important. So much so, that I ❖ may just mention a tiny detail of psychological technique. You ❖ apply the spray, and the patient jumps, and crys out: "That hurts!"

❖ You hold the head firmly, and continue the spray, but you remark:
❖ "It does? That is extraordinary. I never had a patient complain
❖ before. However, in just a moment you will not feel anything."
❖ And in a moment or two more, he will permit you to excavate the
❖ cavity. ❖ ❖

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THE ABOVE is not speculation. It is fact based upon long experience
❖ and practically daily use of ethyl chlorid. Many of my smaller
❖ patients remark: "Doctor, your best office assistant is Ethel. Bring
❖ her out." And others who read these Talks, will recall the remark
❖ of a Minister thus treated who afterwards said: "Whenever I have
❖ a tooth to be treated again I shall begin by saying, 'Let us Spray'."
❖ These little jests are cited, not to make fun, but to emphasize the
❖ fact that ethyl chlorid is like Castoria; "Children cry for it." 1925.

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LIX.

IN A RECENT TABLE TALK a Member made the point that good dentures can be made without the aid of so-called anatomical articulators, and the Secretary admitted that such might be the case; that indeed the most accurate "anatomical articulator," is carried around by the patient himself. Of course there are always two sides to every question (and sometimes more) and it was not our intention to intimate that anatomical articulators are useless. However, what was said has brought forth the following comment from Dr. Alfred Nelson, of Detroit. Dr. Nelson writes:

"I NOTICED in the August issue of the magazine, that the Table Talk contains a reference to full denture construction which, in the light of present day knowledge, appeared to me as having a detrimental influence upon the student in school.

"WHILE MUCH THAT YOU SAY, or rather infer, may be true, remember it is true only in that many men who attempt to use, or interpret mandibular movements, are not utilizing the brains the Lord gave them. They seem to think that the purchase of an adaptable articulator is the equivalent of purchasing a 'nickel in the slot machine,' for the construction of dentures. It is absolutely essential for a man to possess more brains than the instrument, in his attempt to use it.

"YOU WILL NOTE that I did not use the word 'anatomical articulator' as was used in the text of the article referred to. 'There is no such animal' and never will be, for it is manifestly impossible to reproduce all the anatomical features of the human being in metal. I merely mention this as it is not considered a proper term among the men who are informed in this subject. We use the terms 'adjustable,' or 'adaptable' in designating what has been called 'anatomical articulator.' "

DR. NELSON'S CONTENTION that the man using an articulator should possess more brains than the instrument, is quite sound, and reminds me of a bit of philosophy passed out by a Stage Driver

in the Adirondacks this summer. He sententiously remarked: "My Grandfather used to argy, that you can't expec' a man to use common sense, if he hain't got it," which also appears to be quite reasonable.

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DR. NELSON'S PLEA that these articulators should be called "adaptable," or "adjustable," rather than "anatomical," is likewise very timely. We are prone to remark at times that, "A rose by any other name would smell as sweet, as Shakespeare says." But the truth is Shakespeare himself did not voice these sentiments. The words were placed in the mouth of Juliet, an immature girl of sixteen. Those of us who live beyond that age discover that the answer to the question, "What's in a name?" is that there is indeed very much in a name.

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IN THE PRESENT instance, for example, if we think of the modern articulators as being anatomical, we are simply exasperated when we make a set of teeth on one of them, and find the dentures "do not work," and we condemn the instrument, because of course we, ourselves make no mistakes. But if we take Dr. Nelson's advice, and just call the apparatus "an adjustable articulator," we will soon be glad of the aid that it is to us, when we find that, where intelligently used, it reduces the extent of the "spot grinding," necessary at the time of inserting the dentures.

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THE USE OF ETHYL CHLORID for desensitizing sensitive cavities appears to have attracted a great deal of attention, and we have received one adverse comment. This comes from Dr. Solomon Simon, of Brooklyn. After a brief introduction he continues as follows:

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"I WILL FIRST take up the question of ethyl chlorid as a remedy for sensitive dentin. When Dr. Nevins published his 'Conduction and Infiltration Anesthesia' in serial form in 'Dental Items of Interest,' he brought up the same question, and wondered why the method is not utilized to the extent it deserves. I showed this to the late Dr. Alfred Starr, and asked his opinion about it, and he stated that ethyl chlorid should not be used to desensitize sensitive dentin, as death of the pulp will surely follow.

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"DR. ELGIN MaWHINNEY, as far back as 1905 in his 'Oral Pathology and Therapeutics' states: 'Some care must be exercised in order to avoid pain while using, and death of the pulp is a final result.'

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"TAKING INTO CONSIDERATION all these dangers to the pulp, and

also the dangers to the soft surrounding tissues, I do not see why ethyl chlorid should ever be used to desensitize dentin as we now have infiltration and conduction anesthesia, which does the work more quickly and better and more thoroughly, and leaves us ample time to operate, and not to be in any hurry and wonder whether ethyl chlorid will last long enough to prepare the cavity propertly.

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"I WOULD LIKE VERY MUCH to have you state the advantages of ethyl chlorid over infiltration and conduction anesthesia to desensitize sensitive dentin, and why you are such an ardent advocate of it. Personally, I use ethyl chlorid for opening abscesses and in extractions of temporary teeth and in combination with infiltration anesthesia in pericementitis, but to desensitize dentin I find it impracticable and dangerous."

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ONE DISLIKES TO DISAGREE with such eminent authorities as Dr. Alfred Starr, and Dr. MaWinney, yet how shall the Secretary harmonize their positive views as to the danger to the pulp, with his own clinical experience of constant use of ethyl chlorid for over twenty years without the death of a single pulp being reported to him?

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THE QUOTATION from Dr. MaWhinney dates back to 1905, when, perhaps, the technique and limitations of the use of ethyl chlorid were little known. But the opinion from Dr. Starr is more recent. Dr. Starr is no longer with us, and possibly Dr. Simon took his warning more seriously than was intended.

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WE HAVE HOWEVER a good analogy. With the advent of nearly all new procedures in connection with sensitive, or deep cavities, we are warned against causing the death of pulps, and rightly so, because pulp death is a serious accident. In the past, we have been told that oxyphosphate cement might cause the death of a pulp. The silicates have been similarly accused. We were warned that pulps would die if injected with cocain using high powered syringes. Electrolytical applications of cocain were also declared to be a menace to pulp life; and now ethyl chlorid is accused.

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THE PROBABLE TRUTH is, that all techniques should be skillfully applied and only in wisely selected cases. In the pulp deaths reported under cements more particularly, and as following desensitizing methods, it is more than likely that the pulps were already infected by microörganisms at the time of placing the fillings, and that death was a corollary of, but not caused directly by the technique employed.

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IN TEETH WHICH CAN be prepared so as to safely receive a metallic ❖ filling the Club's Secretary unhesitatingly declares that pulp death ❖ will not be, and probably cannot be, caused by the use of ethyl ❖ chlorid. ❖ ❖

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IN SUBSTANTIATION of the above statement, he may mention that ❖ frequently he has used ethyl chlorid as an adjunct to pressure ❖ anesthesia, and has even partially removed the pulp, only to find ❖ later that the amputated stump of the pulp remained alive. Re- ❖ versely, he can report one case in particular, where deep, leathery ❖ decay, was removed from seven teeth in one mouth, actually expos- ❖ ing the pulps in two cases, and that all of these teeth were success- ❖ fully filled, and that the pulps are still alive, six years after the ❖ operations. ❖ ❖

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NO! WHEN PULPS die after the use of ethyl chlorid they are almost ❖ surely pulps that should have been removed prior to filling. This ❖ also applies to pulp death under the cements. ❖ ❖

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AS TO A COMPARISON of ethyl chlorid with infiltration or conduction ❖ anesthesia, I will quote from the advice given to me by a very ❖ prominent physician, many years ago. At that time I was rather ❖ constantly producing a state of analgesia by the use of chloroform, ❖ when treating sensitive cavities, and having reported this to the ❖ physician mentioned, he made this comment: ❖ ❖

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"THERE IS NO PAIN connected with the filling of a sensitive tooth, ❖ great enough to warrant a dentist in endangering his patient's life. ❖ You may use chloroform, as you do, for years without accident, but ❖ some day your patient will die and then you will know what I mean."

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THIS ADVICE WOULD perhaps not have made so great an impression ❖ but for the fact that just two days later the newspapers reported the ❖ death of a fine young boy of fourteen who went to a physician's ❖ office to have a felon lanced. The operation was considered of such ❖ slight importance that his family started for the country in the ❖ morning, leaving the boy to follow on an afternoon train. ❖ ❖

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THE PHYSICIAN just gave the boy "a few whiffs of chloroform so that ❖ you won't feel any pain, my son." After a very few "whiffs" indeed, ❖ the boy died. ❖ ❖

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I AM NOT HERE suggesting that either infiltration or conduction ❖ anesthesia is likely to cause death. Yet it is possible. There is such

❖ a thing as status lymphaticus, which is not readily detected, except
❖ at the autopsy. The important fact is, that the operation of pre-
❖ paring a sensitive cavity is not of sufficient importance to take even
❖ one chance in a million of having the patient die. ❖ ❖

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IT IS OF COURSE possible, though I think highly improbable that a
❖ pulp may die from the use of ethyl chlorid. But there is no record
❖ of the death of a patient from spraying ethyl chlorid into a sensitive
❖ tooth, with the mouth and nasal passages blocked with the rubber
❖ dam. 1926.

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LX.

I HAD BEEN STUDYING DENTISTRY scarcely more than a month, when I learned that one should not extract a tooth when it is "ulcerated." The circumstances were as follows:

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A YOUNG WOMAN with a swollen face, swathed in a lot of bandages, came to the office of my Preceptor to have a tooth "pulled." He examined it and said: "I am sorry, but this tooth is 'ulcerated,' and I cannot extract it today." "But Doctor," said the girl, "it is aching something terrible!" "I know," said my Preceptor, "and I am sorry. I'll put a little medicine on it, and after it 'breaks' come back and I'll extract the tooth."

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IN THE LIGHT OF present day knowledge, this incident recalls the story of Pierre Lamont, which I shall narrate for the moral that it contains.

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PIERRE LAMONT kept a saloon on the outskirts of Old Quebec. One "cold and wintry day," as the story-tellers would say, it was raining hard, and the little stove with its stingy quota of coal scarcely warmed the room ten feet away. Thus the few regulars, the "habitants" so to speak, foregathered closely about the stove, trying to be comfortable. In this they did not succeed very well because the roof leaked like a sieve, and little streams of water trickled through to many crevices, that a man could not stand, dry, between any two.

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THE FOLLOWING DIALOGUE enlivened the moment: "Pierre," cried Gaston, a wizened old bag of bones, "Pierre, I say, dose roofs, she's leak. Why you don't feex him?" "By Gare," said Pierre, "you sure one tam fool. How I feex me dose roofs, while she's rain? Huh?"

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THIS SILENCED GASTON for the time. But three days later, when the sun was shining cheerily, Gaston resumed the subject. "Pierre," said he, "today she's no rain! Why you don't feex dose roofs?" "Ha! Ha!" laughed Pierre. "You one fonny mans, Gaston. Why

❖ I don't feex dose roofs? You wan' know, huh? Well, she's vere ❖
❖ simple. Dose roofs, she's don' leaks today. Voila?" ❖ ❖

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AND THUS IT WAS, in those early days, when "ulcerated" teeth were ❖
❖ not "pulled." When ulcerated, they ached, but could not be ❖
❖ "pulled." But after the "ulceration" "broke," the tooth ceased to ❖
❖ ache, and there was no longer any need of "pulling." ❖ ❖

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IN THE LIGHT of what Dr. Price calls "the newer knowledge," one ❖
❖ wonders how many of those unextracted, ulcerated teeth, brought ❖
❖ the patients as cripples to their graves!" ❖ ❖

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THE ABOVE MONOLOGUE is inspired by a letter recently received ❖
❖ from Dr. Frank Herman, of Belle Fourche, S. D. Dr. Herman ❖
❖ writes as follows: ❖ ❖

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"IF YOU ARE WANTING a subject for discussion, I wish you would ❖
❖ start on 'Why should not an ulcerated tooth be pulled?' The great ❖
❖ majority of dentists will not do it. Why? I once asked this ❖
❖ question of a prominent surgeon and he replied: 'There is no ❖
❖ more reason for not removing such a tooth, than if you had a ❖
❖ splinter in your finger, that was festered. In such case you would ❖
❖ pull out the splinter, would you not?' Was not this logic good?"

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SO MANY YEARS had passed since I had heard of an "ulcerated tooth," ❖
❖ that I was really astonished to learn from Dr. Herman that dentists ❖
❖ of today still practice in accord with this old formula. It seemed ❖
❖ advisable therefore to grant Dr. Herman's request and start a dis- ❖
❖ cussion on this subject. The following brief letter was sent to a few ❖
❖ members of the Oral Surgery Section of the Club. The letter read:

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"THE OLD, OLD QUESTION has come up once more. It is worded, ❖
❖ 'Why should not an ulcerated tooth be pulled?' Personally I may ❖
❖ say, that I do not know what an ulcerated tooth is. Two dictionaries ❖
❖ tell me that an 'ulcer' is a 'lesion of the mucous membrane.' Suppose ❖
❖ we rewrite the question to read thus: 'Is there any good reason ❖
❖ why an abscessed tooth should not be extracted?' " ❖ ❖

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REPLIES HAVE been received from those addressed and may prove ❖
❖ interesting. First we have one from Dr. M. I. Schamberg, which ❖
❖ reads as follows: ❖ ❖

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"AS TO THE DANGER OF REMOVING abscessed teeth it is like most ❖
❖ superstitions that have very little foundation for their existence, and

❖ still have a grain of provocation. When the stock market breaks ❖ badly on Friday the thirteenth, the old superstition about 'Black ❖ Friday' is resurrected. There are many of these combinations of ❖ the calendar, however, that pass off in an uneventful way. ❖ ❖

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"THE OCCASIONAL HARM resulting from the extration of a tooth ❖ during the acute stage, is similar to the dangers from an appendix ❖ operation, or any other surgical procedure during an acute exacerba- ❖ tion. The operation nevertheless may be as necessary, but the ❖ seriousness is proportionately increased by the acuteness of the at- ❖ tack. Other things being equal, it is much to be preferred to ❖ operate between attacks, or before the infection becomes acute. In ❖ some instances an infection spreads in spite of the removal of the ❖ tooth, occasionally because of the removal of the tooth; but more ❖ often because of the lack of proper surgical precaution when it is ❖ removed and proper postoperative treatment. ❖ ❖

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"THE TREND of this reply would indicate that there is little warrant in ❖ the customary fear as to the removal of teeth during an acute infec- ❖ tion. In rare instances, it is definitely advisable, by incisions, to ❖ evacuate and drain an accessible pus area, and await a subsidence ❖ of local symptoms, as well as systemic manifestations of absorption, ❖ before going to the more complete surgical eradication of the dis- ❖ eased area, including the tooth itself. ❖ ❖

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"IN DIABETIC PATIENTS and in the presence of other debilitating ❖ diseases, where wounds, even under ideal precautions, are tardy in ❖ healing, these facts must be taken into consideration. In severe ❖ local infections of a surface character, such as are found in trench ❖ mouth, gangrenous stomatitis, streptococcic stomatitis, etc., surgery ❖ within the mouth, even the removal of teeth, is best deferred until ❖ the virulency of the infection has been pretty well controlled. ❖ ❖

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"THE FOREGOING indicates the difficulty of referring to acutely in- ❖ fected teeth in a single class, and the erroneous reference to any ❖ case as an ulcerated tooth." ❖ ❖

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DR. HAROLD S. VAUGHAN sends us the following reply: ❖ ❖

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"IN ANSWER TO YOUR QUESTION 'Is there any good reason why ❖ an abscessed tooth should not be extracted?' I am assuming you ❖ are referring to an alveolar abscess that may, or may not have ❖ reached the stage of subperiosteal, or subgingival parulis, and would ❖ say that it is my practice to remove such teeth, for the reason that

❖ it is highly desirable to evacuate pus under all conditions, as soon ❖ as possible, to avoid possible invasion of the blood stream by bac- ❖ terial emboli. ❖ ❖

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"THERE ARE EXCEPTIONS to all rules and I see cases at times where ❖ I prefer to resort to incision and drainage first, if the pus can be ❖ thoroughly evacuated in this way, leaving removal of the tooth until ❖ later. This procedure applies to cases where the tooth removal is ❖ likely to be difficult, and where I do not want to add operative ❖ trauma to tissues that are having a hard fight to overcome bac- ❖ terial invasion." ❖ ❖

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NEXT WE ARE PRIVILEGED to present the views of Dr. Henry Sage ❖ Dunning: ❖ ❖

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"IN ANSWER TO THE QUESTION, 'Should an ulcerated tooth be ❖ pulled?' I agree with you; I do not know exactly what an ulcerated ❖ tooth is, but I would say that I believe an abscessed tooth should be ❖ extracted before the abscess is formed, but of course this is not al- ❖ ways done. The abscess is one of the terminal stages of an inflamma- ❖ tion. Abscess and necrosis are generally the so-called last stations ❖ in this process, and I believe it is very poor diagnosis, and also poor ❖ surgery, to let this condition go to these lengths. It should be ❖ stopped on the first ten-yard line. I frequently get a case at the ❖ Clinic, and have for years, where the person has a swollen face ❖ and the 'family doctor' has advised the patient not to have the tooth ❖ out 'until the swelling goes down.' I might say that the dental ❖ practitioner is often imbued with the same idea; namely, that the ❖ tooth cannot be removed until the swelling goes down. I believe ❖ it is an antiquated idea and extremely dangerous. ❖ ❖

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"IF THE GANGRENOUS appendix were treated in the same manner, ❖ we would have a higher mortality rate than we have now. I believe ❖ that we take some little chance in removing abscessed teeth, but I ❖ have seldom seen the extension of infection into the new wound, ❖ caused by the extraction of the tooth, if properly treated. The re- ❖ moval of an abscessed tooth from its socket, is a good deal like ❖ removing the cork from a champagne bottle, 'if you know what I ❖ mean.' You get immediate drainage and very often relieve pus ❖ under pressure, which does inestimable harm every minute the pus ❖ is locked up in the spongy bone. ❖ ❖

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"I WOULD GO FURTHER in my statement as to my treatment of ab- ❖ scessed teeth. I would say that not only should the tooth be re-

❖ moved in the acute stage of the abscess if it cannot be removed before this, but that drainage often should be instituted by incision through the soft tissues into the periosteum. In other words I believe in getting drainage of the abcess outside of the alveolus, and also in removing the cause of the abscess, which is the tooth, simultaneously. ❖ ❖

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"I CANNOT SAY ENOUGH in favor of this treatment for children, ❖ where their resistance is poor, and where the infection, locked up in vascular bone, especially under pressure, often becomes disseminated into the bone, and osteomyelitis, or a dangerous osteitis, is started, which ends in a tremendous loss of bone and a general impairment of health." ❖ ❖

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FINALLY WE HAVE the opinion of Dr. Adolph Berger, as follows: ❖

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"YOUR DIVINING ROD is right again. An ulcerated tooth is here ❖ implied to be a tooth causing an acute abscess, with all the train of symptoms of acute inflammation and suppuration, characteristic of this condition. ❖ ❖

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"THE ONLY REASON against the removal of these teeth, while acute ❖ symptoms are present, is a deep-seated, antiquated tradition, existing in the minds of the lay people, and also in the minds of some members of the professions. The suggestion is that with the removal of the tooth, septicemia (or colloquially speaking 'blood poisoning') may set in. This conception is erroneous and has neither pathological nor surgical foundation. ❖ ❖

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"UNDOUBTEDLY COMPLICATIONS of a grave nature have fol- ❖ lowed the removal of such teeth, but I am rather inclined to believe that this has been due to some error in the performance, or in the postoperative care. ❖ ❖

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"I ADVOCATE AND PRACTICE the removal of these teeth if this ❖ course is decided upon, very promptly. In the clinics which I attend, and also in private practice, my confreres and myself are in the habit of removing these teeth without delay, and have done this in hundreds of cases with no outward complications which would contraindicate this practice. ❖ ❖

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"THERE ARE SEVERAL reasons which speak for the soundness of this: ❖ 1. The exciting cause—i.e., the infected tooth is removed. This

❖ is a recognized good surgical principle. 2. Direct drainage is secured, which is also an approved procedure in all abscess cases. 3. The infected area may be reached with antiseptic or germicidal agents when this is of any value. In those cases where evacuation through the tooth socket is incomplete the removal of the tooth is supplemented with an incision. ❖ ❖

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"THERE IS NO MORE DANGER of dissemination of the infective agencies, in the removal of the tooth, than in incising an abscess and securing drainage and evacuation in this way. Exception to this practice is made in those abscess cases, caused by impacted third molars, in which a considerable amount of healthy bone must be removed to release the tooth. In the simpler types of conditions even here the same procedure is successfully pursued. ❖ ❖

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"THE DICTUM, which has come down from Hippocrates, 'Where there is pus evacuate it,' holds good here as in other regions of the body."

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LOOKS AS THOUGH the "ulcerated" tooth should be "pulled." Amen!

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WITH THANKS TO the Surgical Section for their "kind words," we will now, for a few moments, consider a question of Dental Surgery, which was brought up at the recent very successful three-day meeting of the First District Dental Society of New York City. ❖ ❖

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ONE OF THE ESSAYISTS was Dr. William E. Harper of Chicago. The subject of his paper was "Our Amalgam Failures; Where is the Fault? In the Alloy, or in the Operator?" Near the end of this interesting and important communication, Dr. Harper discussed "Pulp Protection," as follows: ❖ ❖

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"MANY MORE CASES of pulpitis occur under amalgam fillings than with any other permanent filling material. First: Because amalgam is depended upon as a last resort. Second: Because we do not prepare the cavity with the same care as for gold, commonly leaving decay in close contact with the pulp. Third: We do not consider, or recognize, the necessity for protecting the pulp from packing pressure, developed when inserting the filling. This pressure remains as an irritant to be subsequently aggravated into pain, by thermal changes that would have been tolerated in the absence of the irritation resulting from the pressure. Pulps protected from pressure will be found as tolerant to thermal changes under amalgam as under the cements." ❖ ❖

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THE ABOVE is quoted verbatim from Dr. Harper's formal paper, but after reading this, he further explained his views extemporaneously; hence I now quote from memory, trusting that I correctly understood Dr. Harper.

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HE HAD PREVIOUSLY, in great detail, explained his method of packing amalgam so as to obtain a filling that will not leak. Briefly stated, he first "tamps" the amalgam, to make it spread evenly over the floor of the cavity. By "tamping" he means gently tapping. Next he "steps" the amalgam. With a square-faced plugger he uses extreme force in the center of the amalgam, packing it tight against the bottom, and forcing the excess mercury and tin sidewise to the surface. This stepping is then continued systematically around the full circumference of the filling, further compressing the mass. This method of packing amalgam causes it to press with considerable force against the walls.

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DR. HARPER calls attention to the fact that dentin is very elastic; that partly decalcified dentin therefore will yield easily to pressure, and he points out that in deep cavities, where but a thin wall of dentin is left covering the pulp, the pressure of amalgam, properly packed, in accord with his technique, bulges the pulp wall, pulpally, causing pressure against the pulp. It is this pressure that he refers to in the quotation cited.

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I BELIEVE that Dr. Harper is correct in this hypothesis, and I agree with him that in deep cavities the pulp should be protected against such possible stresses. But Dr. Harper omitted to tell us how to protect the pulp.

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IN A WELL-CONSIDERED paper entitled "The Necessity for Revising Cavity Preparation for the Cast Gold Inlay" (Dental Cosmos, Dec. 1925) Dr. John J. Travis discusses the problem of protecting pulps under gold inlays.

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DR. TRAVIS SAYS: "Knowing what we know today of dying pulps, atrophy of pulps, pulps that have become irritated from oft-repeated thermal shock, we must get away from such methods" (meaning the present day cavity preparations).

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DR. TRAVIS does not allude to pressure against the pulpal wall, and thence transmitted to the pulp itself; rather his main argument for pulp protection is protection against thermal shock due to too large masses of metal in cavities cut too deep.

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AS THE DEPTH of a cavity may be beyond the operator's control, it is in such cases that he recommends the following technique:

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"AFTER PARTIAL STERILIZATION (meaning sterilization of the partly decalcified dentin which is to be left over the pulp)—and that is all we can hope to do without injury to the pulp—the tubules should be perfectly sealed with some enduring varnish. I am using Callahan's chloroform rosin for this purpose; .. .. .. "

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DR. TRAVIS RECOMMENDS the filling of the cavity with a stiff mixture of cement "which will contain no free acid after setting is completed," and then he cuts a typical cavity, proceeding just as he would in a sound tooth, following the new form which he recommends, which is a cavity prepared so as to keep the gold as far from the pulp as possible.

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IT WILL BE NOTED that Dr. Travis does not take into account possible pressure against the pulpal wall, but he aims to get protection against thermal shock, by interposing as great a mass of cement as possible between the pulpal wall and the gold inlay, while coincidently he undertakes to protect the decalified dentin from the irritation of the cement itself, by the use of a varnish.

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THIS REMINDS us that cement has often been accused of destroying pulps, whereas investigation has invariably shown that the cavities were deep and the dentin thin over the pulp at the time of filling.

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OF COURSE IN ALL these conditions, the pulp though alive, may be already badly diseased, as shown by Thoma in our September issue, and by Cahn in this number. Such diseased, living pulps, may die, regardless of any type of protection that may be utilized. This misadventure should never be forgotten and "protected" pulps should better not be covered with permanent metal fillings for several months.

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DR. TRAVIS'S TECHNIQUE, of completely filling the cavity with cement and then carving a cavity as though in a sound tooth, is to be recommended when there is time. In such instances I would advise the use of a good silicate cement, in which it will be found that more perfect cavities may be cut. 1926.

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LXI.

IN EVIDENCE of the difficulty of making oneself understood with the use of just ordinary English, we have a letter from Dr. James J. MacMillan, of Carbondale, Penn., taking me to task for cautioning our members against assuming unnecessary risks in the use of anesthetics for the preparation of cavities in sensitive teeth. He begins as follows:

"IN YOUR AROUND THE TABLE TALK, in December, you make the following statement in speaking of the use of——" here he mentions a local anesthetic which has a proprietary name. The statement which he quotes reads as follows: "The important fact is that the operation of preparing a sensitive cavity is not of sufficient importance to take even one chance in a million of having the patient die."

THE DISCOURAGING FACT is that not only was I not speaking of the anesthetic with the proprietary name, but I did not mention that, or any other local anesthetic by name. Indeed, if the truth must be known, while the caution was perfectly appropriate to any anesthetic, as will be shown, I really had in mind a well-known preparation of cocain.

JUST TO INDUCE our members to read more carefully, let us quote what I really did say. First we find the subject introduced in a communication from Dr. Solomon Simon in the course of which he asks: "I would like very much to have you state the advantages of ethyl chlorid over infiltration and conduction anesthesia to desensitize sensitive dentin, etc." Any anesthetic named here? No? Then let us proceed. In reply I find that I wrote as follows: "As to a comparison of ethyl chlorid with infiltration or conduction anesthesia, I will quote the advice given to me by a very prominent physician, many years ago." The advice was not to use anesthetics for such a minor operation as controlling pain in sensitive dentin. Any mention in this of any local anesthetic by name? I do not find it!

DR. MacMILLAN then defends his favorite anesthetic, declares that he does not think that there is one chance in a million that it could cause a patient's death, and then proceeds to tell us of sudden deaths occurring from heart failure, etc., etc. Now that is exactly the point that appears to have escaped Dr. MacMillan. Personally I do not think that any of our properly made local anesthetics is at all likely, per se, to cause death. But death from heart failure, let us say, is just as apt to occur while the patient is under the influence of a local anesthetic, as when he is not. Probably much more so, because of the nervous dread that accompanies the operation. Hence, I said, and I repeat: "There is no pain connected with the filling of a sensitive tooth, great enough to warrant a dentist in endangering his patient's life."

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FURTHER ON Dr. MacMillan makes this very pertinent statement: "I think, Doctor, you have placed a weapon in the hands of the prosecution in case of death occcurring in a dental office, no matter how small a dose of anesthetic were used."

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THIS IS PECULIARLY unpleasant to hear, because for years this magazine has aimed to print information that can be used to defend dentists from blackmailing lawsuits. A number of incidents of the sort might be quoted, but let us just now show Dr. MacMillan what we have done in relation to this very matter of death after use of a local anesthetic.

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A FEW YEARS AGO a patient unfortunately died in a dental office after the use of a minute dose of a local anesthetic. The facts were as follows: The patient applied, complaining of pain caused by an erupting third molar. She objected to the incision of the superimposed soft tissues, without the use of an anesthetic. A sterilized solution of a two per cent. cocain preparation was used. The sterility was assured by the reliability of the manufacturing drughouse, and the further fact that the solution was protected in sealed glass ampules. An injection of only two drops was made, not so much to cause real anesthesia, as to allay the patient's mental perturbation. This because of the fact that the dentist purposed to use special excising forceps, which needed only to be quickly closed, to excise a semi-circular portion of the gum and thus release the stress over the tooth. The pain in any event would be but momentary.

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THE PATIENT FIRST BECAME hysterical, then recovered sufficiently to expectorate and wash out the mouth, and then lay back as though exhausted, remarking: "I have not slept for three nights." At first

❖ it was thought that she was merely sleeping, though she occasionally ❖ groaned. After an hour, however, a violent contraction of the pupil ❖ of one eye was noted. A physician was instantly summoned, and ❖ as one had his office in the same building he arrived promptly, ac- ❖ companied by his assistant. Needless to go into details. Suffice it ❖ to say that a quarter of an hour later, despite every effort, the patient ❖ died. ❖ ❖

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IN SUCH CIRCUMSTANCES it was necessary to call in the City Medi- ❖ cal Examiner, who promptly exonerated the dentist, declaring it to ❖ be a case of status lymphaticus. ❖ ❖

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LET US NOW RETURN to the Table Talk, which is said to have placed ❖ a weapon in the hands of some prosecuting attorney. I find the fol- ❖ lowing important paragraph: ❖ ❖

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"I AM NOT HERE suggesting that either infiltration, or conduction ❖ anesthesia is likely to cause death. Yet it is possible. There is such ❖ a thing as status lymphaticus, which is not readily detected, except ❖ at the autopsy. The important fact is, that the operation of pre- ❖ paring a sensitive cavity is not of sufficient importance to take even ❖ one chance in a million of having the patient die." ❖ ❖

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NOTE, PLEASE, HOW CAUTIOUSLY this is expressed. I do not say ❖ "of causing the patient's death," but "of having the patient die."

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BUT THAT IS NOT all that we have to say on this subject. After the ❖ death above referred to, the matter of status lymphaticus was investi- ❖ gated. Practically nothing about it could be found recorded in ❖ dental current literature, and very little anywhere. It was learned, ❖ however, that at a prominent dental infirmary, the condition was ❖ recognized in a child upon whom a local anesthetic (not cocain) ❖ was being used, and the recognition came just in time to avoid death. ❖ For these reasons we requested Dr. H. E. Tompkins to prepare for ❖ us a paper on this subject, and it should be read by all who think ❖ that there is not one chance in a million that death may result while ❖ using a local anesthetic. The article, "Status Lymphaticus; Its Re- ❖ lation to Anesthesia"—may be found on page 585, August, 1922, ❖ issue. ❖ ❖

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BEFORE PASSING from this subject we have a very interesting com- ❖ munication from Dr. Alfred Walker of New York, who writes as ❖ follows: ❖ ❖

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"MY INTEREST IN THE USE of ethyl chlorid as a dentin desensitizing agent, prompts me to write to you of my experience with that chemical. In 1894 while a student at the New York College of Dentistry, the late George Muth used ethyl chlorid in successfully desensitizing dentin in several of my teeth. Since that experience I have employed it regularly in my operative work, and during all that time I have had but one patient object to its use. In fact in most instances, having had it used once, patients ask for its application at subsequent operations.

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"CONDUCTION AND INFILTRATION anesthesia have a definite place in my practice, but I rarely find it necessary to employ procain, or cocain for densensitizing dentin.

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"IN RE DR. SIMON'S REMARKS . . . . . ethyl chlorid can be applied and the carious dentin removed, in less time than would be required to prepare a procain solution. When a previously prepared solution is used, we must still reckon with the time required to prepare for the injection, the actual time consumed in injecting, and the period of waiting for the anesthesia.

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"HERE AGAIN the ethyl chlorid anesthesia is a decided time saver. As for conduction or infiltration anesthesia being better, the same object is accomplished by both types of anesthesia, i.e., facilitating the painless preparation of the cavity.

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"THE INJECTION METHOD does, of course, induce a longer anesthesia, much longer than is necessary. But can it be said that the projection of a needle into the soft tissue, and the deposition into the blood stream of any solution, even though it be sterile and isotonic, can be as safe as is the local application of ethyl chlorid?

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"AS TO THE comfort of the patients, they will invariably prefer the brief period of pain experienced in applying ethyl chlorid (which after all is but the sensation of extreme cold upon the tooth) to the disagreeable and oftentimes sickening sensation of a hypodermic puncture, and the local and systemic reaction which accompanies the deposition of the solution.

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"AND NOW FOR THE OLD BUGABOO of the death of pulps because of thermal shock. In the thirty years that I have employed ethyl chlorid I have yet to record the death of a single pulp, that could be attributed to its use. Nor have I at any time been able to find a single instance of pulp death due to any form of thermal

shock, unless it be an extreme of temperature that the body could not survive."

DR. HENRY W. GILLETT contributes to this subject as follows:

"THE USE OF EVERY PROCESS for desensitizing dentin, or for nerve blocking as a means for enabling painless cavity preparation that has been in successful use since the electric engine has also been commonly used, has been accompanied by reports of mysterious pulp deaths. I have frequently called attention to the practical certainty that a considerable percentage of these have been due to lack of caution in using the engine bur in teeth in a condition precluding there being any warning that too long application of a rapidly revolving bur was heating the tooth to a point meaning danger for the pulp. A pulp can be very effectively baked in this way, and I am confident that just that has happened in many cases, and that it is happening and will continue to happen in the hands of careless operators—especially of those who pride themselves upon their speed at the operating chair. The freezing effect of ethyl chlorid would seem to obviate this danger." 1926.

LXII.

APICAL FOCI OF INFECTION would rarely occur if the pulp could be kept alive and healthy, or if the canal once infected could be sterilized. A few opinions on these subjects therefore might be germane, and of interest at the moment. The following question, or questions, reached us from Dr. Rudolph L. Burt of Bradford, Penn.

"I HAVE BEEN reading the articles published in the July and August issues of the Dental Items of Interest by Prof. Hopewell-Smith on the subject of infection of the dental pulp. In the closing paragraph of the last issue he states that antiseptics should be used in the sterilization of the cavity by repeated applications. That is a statement many writers make, but I have failed to find any of them telling us about the antiseptic value of drugs used. What drug is indicated? Is phenol the best drug where silver nitrate cannot be used due to discoloration? Is there any drug less irritating than phenol which has better penetrating power? On page 504 of the July issue he states that in all cavities where decay is extensive, eugenol should be sealed in 24 hours or more. Is this to be used in addition and previous to the antiseptic of the formaldehyd series? Would this combination of antiseptics be better for cavities in posterior teeth than silver nitrate? If the eugenol were sealed in a cavity in a posterior tooth in which silver nitrate is to be precipitated, it would cause instant precipitation, and no penetration of the silver would result. Mercurochrome is a popular antiseptic today. Can it be used in sterilizing cavities? Is there any drug which will remove the stain of this from a tooth?"

DR. BURT'S QUERIES were submitted to Prof. Herman Prinz, who kindly replied as follows:

"IN REGARD TO STERILIZATION of a tooth cavity, we have found from an extended series of tests that, within limitations, complete sterilization of a carefully excavated cavity can be obtained with the following solution: thymol one ounce, alcohol, enough to make two ounces. The mode of procedure is as follows: The cavity is ex-

cavated; it is dehydrated with alcohol; the thymol solution is applied and with warm air the alcohol is evaporated. On examining the cavity with a magnifying glass, a deposit of thymol in crystal form may be observed. The cavity is now coated with a good, hard copal varnish. I recommend that made by the Ivory Manufacturing Company.

"THIS VARNISH contains a specially prepared copal resin. The above process will not discolor the tooth and no interference with the vitality of the pulp is usually observed. If silver nitrate is used for this purpose, it will do the work equally as well, except that it will discolor. Of all the available metallic salts, silver nitrate is the most serviceable as it is absolutely limited in its action. This is not the case with zinc chlorid, for instance.

"OCCASIONALLY, there will be a mild form of pulp irritation observed from any drug applied in deep cavities. However, with the above two drugs, possibly the least ill effects are obtained. Any other drug like phenol, creosote, lysol, hydronaphtol, etc., has not given in our tests, as good results as the thymol solution.

"REGARDING, the much discussed properties of mercurochrome as an antiseptic, I must emphatically warn against its use for such purposes, as it will hopelessly stain the tooth a pronounced pink color, which it is almost impossible to remove. I have seen two or three cases of this type. My efforts in bleaching such stains were unsuccessful, and in one case we were forced to extract two lower, heavily-stained pink incisors.

"IN REGARD TO pulp irritation, I have found that the best drug combination for its relief is a solution of chloretone in pure oil of cloves in the proportion of 150 grains of chloretone dissolved in one ounce of oil of cloves. This material is sealed in the dehydrated cavity for twenty-four to forty-eight hours and, if the pulp is at all amenable to drug treatment this combination is the most serviceable for the purpose. This compound should not be used in connection with silver nitrate, but the latter may be applied at a later period, as otherwise the reduction of silver would occur at once.

"UNDER NO CONDITION employ formaldehyd for the purpose of sterilizing a tooth cavity. Any preparation containing this compound, in liquid or dried form, will hopelessly injure the pulp and usually death of this organ is the result in due time."

DR. PRINZ'S ALLUSIONS to silver nitrate, bring us nicely to a letter recently received from Dr. Bernard Berg of Boston. He wrote as follows:

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"'A' SAYS THAT silver nitrate, as advocated by Dr. Percy Howe should not be used and is unnecessary in root canal technique. 'B' says that the opposite is true. Please give me your views? Also please state your favorite root filling materials."

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I DICTATED A REPLY which will be found below, and subsequently asked Dr. Berg to let Our Club read the replies that he received. He kindly forwarded them, with the statement that permission to publish should be obtained from the various writers. This has been done. Dr. Berg permits me to mention that he himself is represented by "A" in this discussion.

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DR. HERMAN PRINZ replied as follows:

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"REFERRING TO YOUR LETTER of February 3, let me say that we find that silver nitrate as advocated by Dr. Howe, is unnecessary in the treatment of root canals."

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DR. U. G. RICKERT, of the University of Michigan, Dental Department, answered as follows:

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"IN REPLY TO YOUR QUESTION, I would say that something of the nature of silver should be used in all root canals if treatment must be employed where the pulp has been dead for some time and the organic matter of the dental tubules has undergone degenerative changes. Silver, if properly administered in the apical third, is very helpful in that it clogs the dental tubules and reduces diffusion, and there is considerable reason to believe that it also detoxicates, acting in this way as a catalyzer.

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"I WOULD FEEL much safer in my own mouth if I knew that the dentin of the apical third were well clogged with finely divided silver. In fact, I would have no objection to lining the walls of the canal with silver even in freshly devitalized teeth, for here one would get an insoluble albuminate, or silver protein which in itself would permit less diffusion, with less likelihood of becoming toxic after a time.

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"THE TWO MAIN OBJECTIONS to silver solution are: first, the discoloration attendant; and second, if it gets beyond the apex in

certain cases, it becomes tremendously irritating, setting up pericementitis, which is severe for from thirty to seventy-two hours. If you can actually get it to the apex without irritation, it is worth while, but if it is only placed in the upper part of the canal, it is of less value, because the cementum is itself a protection in this region of the tooth."

DR. ARTHUR B. CRANE, of Washington, D. C., replied as follows:

"HOWE'S SILVER REDUCTION METHOD is an efficient method of sterilizing the dentin of the root in situ. When it escapes through the apical foramen it often results in more harm than good. When it touches the coronal dentin it causes a discoloration, which cannot be removed. It is unnecessary to use it, as other antiseptics will more safely sterilize the dentin."

DR. EDGAR D. COOLIDGE of Chicago sent the following reply:

"YOUR LETTER ASKING about silver nitrate received. In reply I will say that I think any operator should use the method of treatment and filling of root canals that will give him the best results. That does not mean that I favor continuing an obsolete practice, nor do I favor changing from one to another. By constant study and application one can determine what is worthy of continual use.

"I DO NOT USE the silver nitrate method of treating canals as suggested by Dr. Howe. There is no denying that silver nitrate is the only drug that is prophylactic against the bacteria that cause dental caries, and it is quite likely that it will seal bacteria within the dentinal tubules of the root and help materially in preventing a reinfection after filling the root. However, I have not felt the necessity of discoloring the teeth to accomplish this, and my results as proven by radiographs of root filled teeth, year by year, show a very high percentage of satisfactory results, without the use of silver nitrate. I use nothing but chloro-percha, or euca-percha, and gutta-percha cones cut in short pieces and packed into the canal bit by bit. I often coat the canal with Callahan's chloro-resin varnish, and dry it before packing the gutta-percha points."

DR. HARRY B. JOHNSTON, of Atlanta, Georgia, expressed his views as follows:

"REPLYING TO YOUR RECENT letter in reference to the use of silver

❖ nitrate in root canals, will say that I am not perfectly clear as to ❖ your exact meaning. If one is to use the Howe technique, he is ❖ necessarily compelled to use the ammoniated solution of silver ni- ❖ trate, but, if it is used in techniques other than this, I am not aware ❖ of it. ❖ ❖

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"PERSONALLY, I DO NOT advocate its use, as I have found that in ❖ my hands iodin ionization is not only far superior as a sterilizing ❖ means, but for purposes of stimulation as well. Therefore, answer- ❖ ing your question briefly, I would say that it is unnecessary and in- ❖ advisable in the great majority of cases. ❖ ❖

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"REPLYING TO YOUR QUESTION as to my favorite ingredients for ❖ filling root canals, will say that I use the materials advocated by the ❖ late Dr. Callahan—that is, a thin solution of pure pine resin in ❖ chloroform, and pure base-plate gutta-percha points." ❖ ❖

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DR. THOMAS GILMER of Chicago, replied as follows: ❖ ❖

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"I SERIOUSLY OBJECT to the use of any medicament in root canals ❖ which does more than sterilize the canal and apical infection. We ❖ know that silver nitrate alone does change the texture of the dentin ❖ and penetrates to and injures or destroys the vitality of the cemen- ❖ tum, but I am unable to state whether Howe's formula is open to ❖ the same objection. We do know that it does at times cause irrita- ❖ tion of the apical pericementum indicated by soreness of the tooth. ❖ In our research department we find the Howe's solution does pene- ❖ trate the tubules, but we have not observed its effect sufficiently long ❖ to be able to answer your question intelligently. Tincture of iodin ❖ and creosote, equal parts, is one of the oldest and, in my opinion, ❖ is the best medicament for the purpose indicated. No medicament ❖ should be used for a great length of time since it may do a real ❖ injury to the periapical tissues. I am still partial to chloro-percha ❖ and gutta-percha points." ❖ ❖

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DR. WESTON A. PRICE answered as follows: ❖ ❖

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"WHILE MY RESEARCHES have not revealed any substance that is ❖ able to pass from the dentin to the cementum directly, and destroy ❖ infection in the cementum, I am of the opinion that silver nitrate ❖ in its various methods of use is as good a means for sterilizing the ❖ dentin as is available. Personally, I have very little confidence that ❖ the sterilization of infected dentin is adequate, when there is in- ❖ fected cementum, and our evidence is overwhelming in support of

❖ the contention, that the cementum about the apex of the tooth is ❖ infected, when the pulp is putrescent. I am looking for evidence ❖ to the contrary, and hope some method can be provided that will ❖ accomplish the ends that are urgently required. ❖ ❖

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"IF ANY OF THE advocates of silver nitrate treatment can present evi- ❖ dence that silver nitrate will pass from dentin to cementum in such ❖ a manner as to sterilize it, please assure them that I will be grateful ❖ for this greatly desired information." ❖ ❖

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THE CLUB'S SECRETARY replied as follows: ❖ ❖

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"YOUR INQUIRY IN REGARD to the use of silver nitrate cannot be ❖ answered with a simple "yes" or "no." Dr. Weston A. Price long ❖ ago reported, first, that nothing that can be used in the mouth will ❖ really sterilize infected dentin. After the appearance of Howe's ❖ silver nitrate, he revised this, after tests, and said that silver nitrate ❖ will sterilize dentin if anything will. ❖ ❖

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"IT IS PERHAPS wrong for me to express any judgment of silver nitrate, ❖ because I have never used it. My objections to it are first, that it ❖ badly stains the tooth and that it is difficult to restrict the stains to ❖ the invisible portions of the tooth. ❖ ❖

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"ON THE OTHER HAND, in view of the sterilizing qualities, it is more ❖ than posible that it would be good treatment in a large canal, badly ❖ infected, and situated so that possible staining would be of no con- ❖ sequence. ❖ ❖

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"IN REGARD TO MY preference of materials in filling root canals, I ❖ am still using chloro-percha with gutta-percha cones. In infected, ❖ or doubtful canals I first use Callahan's chloro-resin technique. As ❖ Dear Old Cal once said: 'This may not destroy the bacteria, but ❖ it increases their high cost of living.'" ❖ ❖

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WE HAVE ANOTHER communication from Dr. Prinz, and I am sure ❖ that the Club Members feel as I do, that we cannot have too many. ❖ In the letter granting permission to publish his answer to Dr. Berg, ❖ he sent the latter communicaiton found here, which he declares is ❖ germane to the general subject. It certainly is, since we have had ❖ so much to say recently about the treatment of fissures. Here is ❖ Dr. Prinz's method: ❖ ❖

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"TREATMENT OF FISSURED SULCI in teeth.—1. Apply 1 per cent. nitric acid with a small hatchet shaped excavator, or explorer, into every crevice of the fissure. 2. After one minute, apply a freshly made concentrated solution of silver nitrate, upon the moist surface. Rub the solution thoroughly into the fissure. Reduce the silver nitrate by applying a 1 per cent. sodium hydroxid solution, or a hot burnisher and warm air. (To make a fresh concentrated silver nitrate solution crush a few crystals on a glass slab and add a few drops of the 1 per cent. nitric acid solution.) 3. Dry the fissure with warm air and fill the crevices with black copper phosphate cement.

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"STERILIZATION OF CAVITIES.—1. Dry out the completely prepared cavity with cotton, followed by warm air, until it has a chalk-like appearance. 2. Saturate the cavity with thymol solution on cotton and evaporate to dryness. (Thymol solution: one ounce of thymol dissolved in alcohol enough to make two ounces. Keep in a well-stoppered bottle.) 3. Coat the cavity with copal-resin varnish and apply warm air until dry."

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LASTLY WE FIND in the Club's Mail Box, a letter from Dr. Edgar G. Paul, in which he expresses his views on the extraction of teeth, where acute inflammation is present. He writes as follows:

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"YOUR DISCUSSION in the January issue, regarding the extraction of teeth, where acute inflammation and infection are present, has resulted in a unanimous verdict of those consulted, as to what is the proper practice. With these I agree, but only a few weeks ago, I understand, an eminent cardiologist, Dr. Harlow Brooks of New York, in a paper delivered in Detroit, said, that he would not allow a patient of his to have a tooth extracted where an acute condition existed. I believe those who have the greatest opportunity of noting the clinical results of the procedure recommended will agree that there are practically no contraindications to this practice. Two fundamental surgical requirements have been satisfied, first, in removing the cause, and second, establishing drainage where pus is present. Some reference was made, by a few of the men consulted, to the necessity of postoperative care or treatment, but they did not enlarge on this phase. Most people would agree that a flushing of the socket to provide a mechanical cleansing and removal of infected material from the socket would be good practice. But what then? My practice has been, in most cases, to place a gauze dressing of a strong sedative and antiseptic (thymol-iodid with oil of cloves) into the socket and leave for about half an hour, and then

❖ remove. This does not prevent the formation of a normal blood
❖ clot which I have always considered nature's greatest defense against
❖ infection and soreness. Some operators would advise the leaving
❖ of a dressing in the socket for at least a day, and I cannot imagine
❖ a finer plug for the socket than gauze impregnated with blood clot,
❖ absolutely preventing the least drainage, and defeating the purpose
❖ for which it is claimed it should be inserted. Besides, I have never
❖ yet been able to wash out any pus from a socket subsequent to the
❖ primary operation. This does not apply to an incision in the soft
❖ tissues for drainage, which must be kept open by a dressing and
❖ from which pus can often be washed out days after the operation.

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"DURING THE WAR, the use of subsequent packs and dressings, as
❖ routine practice, lost favor, and I doubt very much whether they
❖ serve any good purpose except in dry, or painful sockets." 1926.

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LXIII.

HAVING RECENTLY PUBLISHED the views of several practitioners who wrote adversely of the Howe silver nitrate method of treating teeth, it is but fair to present to the Club Members, the following communication from Lieutenant Commander (D. C.) Paul G. White, of the Navy. The letter is on the stationery of the White Star Line steamship "Celtic," written while Dr. White was en route to Liverpool, and is dated May 14th. It reads as follows:

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"YOUR EDITORIAL, 'Why Do Pulps Die Under Fillings,' and your 'Around the Table' talk which follows in the last issue, have just been read by me.

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"UNDOUBTEDLY YOUR EDITORIAL was for the purpose of inciting comment in order to give more light on the subject. It seems to me that a great many of your 'Round Table' guests have not given this subject much deep thought, or else they have been working under the old technique, given out by Dr. Howe, when the solutions were originally prepared.

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"WHILE NOT PROFESSING any superior knowledge, or original investigations in root canal therapy, I have conscientiously tried out all the approved methods of our most noted investigators, with the assistance of a large staff of operators, and can truthfully say that with the improved technique of using Dr. Howe's ammoniacal silver nitrate and formalin solutions, we have had the greatest number of successful cases.

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"I KNOW OF NO MANUFACTURER, who makes the assertion 'that sterilization of dentin which covers the living pulp will safeguard the life of a pulp,' without its being qualified. If a pulp is deeply infected or diseased, or if an operator does not get deep penetration of silver, success would not be accomplished. It appears that we must deal with this subject in bacterial terms, instead of surgical terms.

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"THERE SEEMS to be a general misunderstanding as to the theory of these solutions. Precipitation of silver, as mentioned by various dentists, indicates that they believe this is the theory. Others mention the use of eugenol, which shows that they do not understand the theory. If a dentist will refer to his chemistry and reduce the solutions to chemical terms,—formalin is not present as shown by the reaction.

"THERE ARE OCCASIONAL ACCIDENTS, where a drop of silver gets on the tissues in the mouth. It immediately turns the tissue white. If there were no bacteria in the mouth, the tissue would not be turned white. The surface cauterization is brought about by bacteria always present in the mouth.

"AT THE APICAL END of a pulpless tooth, there is always a point of contact where bacterial toxins are being combated and sound tissue begins. Here silver has great value.

"ANOTHER MATTER that is very much misunderstood, is the filling of canals. In reading criticisms we find mention that the large canals are not filled. It is the minute openings that the silver will dispose of. Let the operators take care of the large ones in the usual manner after they sterilize the tooth. Let us give ammoniacal silver nitrate and formalin a fair trial.

"IT MAY BE of interest to you to know that at the U. S. Naval Hospital, at Norfolk, Va., where I am at present stationed, I have induced the genito-urinary man, to try these solutions on chancroid cases, and we have been getting wonderful results up to the time of my sailing for Europe. If you are interested, I would be glad to send you our reports of cases upon my return July 8th, 1926." 1926.

LXIV.

I REMEMBER reading a novel once which began something like this: "When I reached my destination it was raining. Anyone who was there at the time will know what I mean." To paraphrase that author's brief but expressive statement let me say that, "Tonight it is hot!" And all the members of the Club who failed to attend the meeting tonight, know that it is Hot. And as not a single member has responded to the call, I would say that the entire Club knows that it is Hot. And the Secretary knows it also. But unfortunately a Secretary is supposed to attend all meetings, regardless of what quorums may do.

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BEING THE ONLY ONE PRESENT at Roll Call, the Secretary considers it his duty to "fix up" some minutes, to read at the next meeting. To start with then, he would call attention to the June issue of the Minneapolis District Dental Journal, which by the way is "some Journal." If you doubt it read what the New Editor, Dr. Thomas P. Ryan, says. He tells us that, "Minneapolis has been called the Hub of Dentistry." Also that, "Requests have come from Maine to Oregon, from Northern Minnesota to Tennessee, and our own neighboring states of Iowa and Wisconsin, for the privilege of republishing these articles," etc., etc.

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WELL, MR. EDITOR, agreeing with you that your Journal is a fine Journal, and wishing you God Speed, in your new task, (we use the word "task" advisedly) the Secretary begs to inform you that he intends to read tonight to the absent members of this Club, a certain article and the discussions thereon, which he finds in your interesting "paper," for June, and to incorporate certain paragraphs thereof, whole or in part, without asking you, or waiting for your permission. You would grant it? I knew you would. Thanks! Let's go!

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BEFORE BEGINNING the reading, however, I want to tell the Club Members the latest definition of a Pessimist. "A Pessimist is a man who will not cross a one-way street, until he has looked both ways." Not so foolish at that. What made me think of that little joke is

❖ that the article that I wish to call to your attention relates to the ❖ general subject, "The Devitalized Tooth as a Focus of Infection." ❖ Now the Apostles of this Creed have been driving in a one-way ❖ street, for some long time, but there must have been quite some ❖ Pessimists at that particular meeting of the Minneapolis Dental So- ❖ ciety, because the men who discussed the subject certainly looked ❖ both ways. ❖ ❖

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PERHAPS I OUGHT to inform you that the distinguished authors of ❖ this paper, which is a mighty fine paper, were Allen C. Nickel, M.D., ❖ of the Division of Experimental Bacteriology, and William A. Crich, ❖ D.D.S., Fellow in Dental Surgery, The Mayo Foundation, Rochester, ❖ Minn. ❖ ❖

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NOW THEN, BEFORE GOING ANY FURTHER, the Secretary wishes ❖ to state that while he intends to quote liberally from this paper and ❖ its discussions, he likewise means to make a few passing comments, ❖ and before passing he wishes to make this comment; to wit; if the ❖ Authors really meant to confine their discussion literally to the ❖ "devitalized" tooth, the present debatant could not debate the sub- ❖ ject at all, because in his opinion a devitalized tooth is a dead tooth, ❖ and a dead tooth should always be extracted. But it would appear ❖ that the Authors really meant "pulpless" teeth, or at least they were ❖ so understood by those present, as we shall see. ❖ ❖

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IN ITS GENERAL TREND this paper follows the route that has already ❖ been traveled by Rosenow, Price, Haden and others. The postulate ❖ is; Given a human being with an infected tooth and suffering also ❖ with some acute systemic lesion of metastatic origin; extract such ❖ tooth, prepare a pure culture from the germs about its apex; inject ❖ same into a rabbit, and if said rabbit becomes afflicted with the ❖ same disease from which the human being suffered, then the hu- ❖ man being derived his systemic disease from said infected tooth. ❖ Q. E. D. ❖ ❖

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AT THE OUTSET the Authors tell us that they are considering the ❖ "devitalized" tooth as a focus of infection. They also speak of ❖ "nonvital" teeth. Yet in the discussion we find Dr. Hartzell mak- ❖ ing the following comment; (Let me interrupt myself here to state ❖ that it is my purpose to place certain passages in the paper and dis- ❖ cussion in close juxtaposition in order to enhance their value.) Dr. ❖ Hartzell said: ❖ ❖

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"THE PULPLESS TOOTH IS NOT A DEAD TOOTH. The peri-

dental membrane of the pulpless tooth cannot be distinguished from the peridental membrane of the living tooth, if they are placed side by side, properly stained, under the microscope. The nuclei of one stains as sharply as the nuclei of the other. The cementoblasts living in the cementum of the pulpless tooth are nourished through the peridental membrane."

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I WISH NOW to quote from Drs. Nickel and Crich, but for a reason that will transpire, I here transpose certain paragraphs, and shall give first the exceedingly careful technique followed by these gentlemen in their endeavor to procure pure and uncontaminated cultures of the organisms being investigated. They thus describe their technique:

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"THE TECHNIC EMPLOYED in our experiments is similar to that which is used by Rosenow, Haden, and others. The operative field is walled off with sterile sponges, thoroughly painted with two applications of 10 per cent. mercurochrome (a few seconds elapsing between applications), and then alcohol is applied. Particular attention is directed toward getting the mercurochrome and alcohol into the interproximal spaces. A dry swab is used to remove the excess drug. The tooth is then extracted as carefully as possible. The upper anterior and bicuspid teeth are the most suitable for culture. The apex is nipped off directly into small tubes containing about 2 c. c. of gelatin Locke solution with sand. After being shaken for about ten minutes the material is streaked aerobically on a blood agar plate, some is pipetted into tubes of glucose brain agar (Rosenow's soft agar) which has previously been boiled and cooled to 40° c., and the remainder is inoculated into glucose brain broth. Because the normal flora of the month consists mainly of aerobic organisms, while that of the apexes of the teeth is known to be of a low oxygen tension, the blood agar plate is used as a control and as a medium for filing away strains. The number of colonies in the soft agar as compared with those on the blood agar plates served as an index of the degree of infection present in the focus."

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NOW LET US UNDERSTAND THIS as we go along. These investigators are making a research in regard to the relation of apical foci of infection to distant systemic disease. When they speak of "focus," they mean a focus in the periapical region. We do not understand them to be studying infection within the tooth itself. All the members of the Club will admit that sincerely careful precautions were taken. Yet they made a slip; one door was left unguarded, and through that door passes the entire logic of their deductions.

❖ At least so it seems to me, after reading the following remarkably ❖ keen comment by Dr. Carl Grove. In part Dr. Grove said: ❖ ❖

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"THE EXTRACTION of all pulpless teeth has become common practice. ❖ This is due to the claim that all such teeth are infectious because ❖ Streptococci can be obtained from the tips of these roots when placed ❖ in culture media. ❖ ❖

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"THE MERE FACT that a growth of Streptococci can be obtained from ❖ tips of pulpless teeth when placed in culture media does not neces- ❖ sarily prove that such teeth are infectious. ❖ ❖

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"IN CUTTING off the apical portion of the root, as is done in these ❖ experiments, the tips would, of course, be partly dentin. The bac- ❖ teria thus obtained may be from the dentin, whereas the cementum ❖ covering this dentin may not be infected. ❖ ❖

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"CEMENTUM forms an impervious covering of the dentin; therefore it ❖ is not possible for bacteria to reach the periapical tissue through the ❖ cementum. In the experiments referred to above, the cementum is ❖ cut away when removing the tip, making it possible to obtain bac- ❖ teria from the inner portion of the root. It is only infection on ❖ the surface of the root that produces systemic disease. ❖ ❖

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"THE THICKNESS of the cementum at the apex is not sufficient to be ❖ used for these experiments. The average thickness is less than one ❖ millimeter. As it is not possible to determine the thickness of the ❖ cementum of a root without cutting into it, no one can claim that ❖ only the cemental tip was used. ❖ ❖

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"SINCE IT IS experimentally possible to seal the foramen to prevent the ❖ escape of bacteria, we can safely assume that the same results will be ❖ obtained in teeth in the mouth." ❖ ❖

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OF COURSE YOU APPRECIATE the point of Dr. Grove's argument. ❖ Think it over. The intention is to investigate the disease energy ❖ of organisms collected from the apical end of a tooth. Extraordi- ❖ nary efforts are made to avoid contamination from the oral cavity, ❖ and when that has been seemingly done, "Snip!" the tip of the root ❖ is excised and dropped into a culture medium. And now Grove ❖ points out that at this instant of snipping, the dentin is exposed, ❖ and the cultures resulting might have come from organisms within ❖ the dentin, and not upon the outer surface of the root at all. There

❖ is another significant point in this, but we must proceed in due order.
❖ Let us go back now and quote another statement from Drs. Nickel
❖ and Crich. They tell us: ❖ ❖

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"DURING THE EARLY PERIOD of roentgenography in dental work,
❖ only such teeth were condemned as showed a rarefied area around
❖ the apex. The granuloma which causes this appearance is nature's
❖ defense mechanism against systemic infection. The devitalized
❖ tooth, without such evidence of granuloma, was entirely disregarded.
❖ Since that time various investigators have shown, by the best known
❖ technic, that cultures from the apices of such teeth contain almost
❖ pure cultures of partial-tension Streptococci which often produce
❖ in animals, lesions corresponding to the lesions of the patient. There
❖ is infection at the apices of the great majority of devitalized teeth.
❖ If bodily resistance and immunity are adequate, nature tries to over-
❖ come the infection through the formation of a granuloma in ex-
❖ actly the same manner as it tries to wall off a systemic infection by
❖ the formation of an abscess. However, if there is not enough resist-
❖ ance to wall off the infection, no abscess is formed, but instead,
❖ poisonous products continually drain into the body. It seems reason-
❖ able, therefore, to consider roentgenologically negative devitalized
❖ teeth as foci of infection, and as a menace to systemic health." ❖

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STRANGE TO SAY the Secretary does not consider this postulate at all
❖ reasonable, but then of course he does not account himself as being
❖ versed in the sciences of bacteriology and pathology. But basing
❖ his opinions upon experience, and especially upon experience with
❖ the x-ray, he did not accept this theory when presented by Weston
❖ A. Price, and it seems no more tenable now. But let us again quote
❖ from Dr. Grove: ❖ ❖

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"A LARGE PERCENTAGE of teeth showing no radiographic evidence
❖ of infection will, if examined microscopically, be found to be free
❖ from infection of the periapical tissue and a perfectly sealed fora-
❖ men with cementum and sometimes a production of fibrous tissue is
❖ found. ❖ ❖

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"IT HAS BEEN asserted that the removal of the pulp produces a perma-
❖ nent lowered resistance of the periodontal membrane, eventually re-
❖ sulting in periapical infection of all such teeth. However, this as-
❖ sertion is refuted by the fact that a large percentage of pulpless teeth
❖ have normal periapical tissue with resistance to infection equal, I
❖ believe, to the teeth with vital pulps. ❖ ❖

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"IT IS POSSIBLE for the tissue normally found in the foramen to be transformed to cementum, or to scar tissue after pulp removal. Such teeth are no more susceptible to infection than teeth with vital pulps. The periodontal membrane serves as a covering and is attached to the cementum that is laid down in the foramen, in the same manner as is found on other parts of the root. It also contributes nutrition to this newly formed cementum. Since this cementum has the same histological characteristics that other cementum has, it should have the same qualites in other respects.

"PULPLESS TEETH which have vital normal periodontal membrane covering the root end are not infected. If infection is present it would be discernible when these tissues are sectioned and examined microscopically.

"WHILE THE REACTION carried on by the cytoplasm of the cells of the pulp tissue is no longer maintained after the pulp is removed, the physical material already formed still exists, which will function very efficiently, even in the absence of the pulp.

"IF DEATH of the entire tooth structure resulted from pulp removal, a degeneration of the adjacent tissue could then be expected, but since vital cementum covers the dentin and periodontal membrane covers and is attached to the cementum, from which the cementum receives its entire nutrition, such teeth cannot be regarded as necrotic."

AND THIS BRINGS US nicely to the special point that I wish to make. The distinguished authors, whose splendid paper we are considering, tell us that a granuloma is a defensive measure, and an index of the power of resistance of the subject. Others, notably Price, have said the same thing. An analogy is drawn to an abscess, but all analogies are dangerous. Two analagous things are not necessarily identical. What occurs in a rabbit may not occur in a man. What happens in a research laboratory may never happen in a human body. Whether or not a granuloma is a defensive process we will leave for discussion at a future time. In passing, however, let us point out that the radiograph may lead us to suspect the presence of a granuloma, but it cannot inform us whether or not such granuloma may be a potential cyst.

A GRANULOMA, if a defensive process is a very poor defense if latent epithelial cells happen to be in the neighborhood, because in that event the granuloma provides most inviting tissue in which the

epithelial cells will proliferate, with the final result of producing a radicular cyst, which, if neglected, may result in the destruction of an entire maxilla, or the major part of a mandible.

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EVEN IN THE absence of the epithelial cells, the granuloma itself almost invariably increases in size, coincidently destroying bone, and enlarging the area of apical infection. Hence I think we may still accept the radiographic indications of a granuloma as a danger signal, upon which to base the doctrine that unless treatment can destroy the granuloma, to the extent that a subsequent radiograph will show the lost bone to have been replaced, the tooth must be extracted. But with such treatment, and with such radiographic evidence, the tooth may be retained.

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WHAT THEN OF THE "roentgenologically negative" tooth? Much, in fact all, must depend, first, upon the quality of the radiograph; and second, upon the ability of the practitioner to interpret a good radiograph when he is fortunate enough to see one. What one man may account as radiographically negative, a keener radiodontist may consider as radiographically positive. I have not seen any examples of "radiographically negative," teeth, so adjudged by the present writers. But radiographs presented by other writers in support of this doctrine have invariably been so poor in quality as to be actually valueless.

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JUST WHAT IS MEANT by "radiographically negative?" I think the term is meant to comprise such radiographs as do not show bone destruction at a root apex. But Grove gives us a key to the true reading of such radiographs when he says: "Pulpless teeth which have vital normal periodontal membrane covering the root end are not infected." Only I think he said, or meant to say "infectious" rather than "infected."

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HENCE IT MUST FOLLOW that before a radiograph can properly be called "negative," it must show the details of the tissues around the root end so distinctly that the interpreter may determine, first whether the bone has been invaded by disease; second, whether or not the peridental lamella is still intact; and third, whether the periodontal membrane and the cementum itself is still healthy. At times, to accomplish this, a very exact radiographic technique is needed, and not less than two radiographs required. One taken with a time exposure that will best delineate the alveolar bone; and another taken with a much longer exposure, to show whether or not the apical foramen has been closed with secondary cementum. It is

❖ rarely possible to have more than one tooth, and one might say one
❖ root, thus accurately shown in a single picture. In making diagnoses
❖ in doubtful cases of this character, I have even taken three or more
❖ radiographs to study the roots of an upper molar. ❖ ❖

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WHEN A RADIOGRAPH of a pulpless tooth is sharp in detail and
❖ shows that there is no loss of the alveolar bone; that the peridental
❖ lamella is continuous around the apex, and the periodontal mem-
❖ brane equally clearly defined, with a cementum that is not rough-
❖ ened, and a foramen that is closed, such a tooth may be called "ra-
❖ diographically negative." And such a tooth is not infectious. If
❖ any of the above factors are not clearly shown, the tooth cannot be
❖ considered as radiographically negative. It is the radiographic in-
❖ terpretation that is negative. It is worse than negative; it is useless.
❖ It is worse than useless; it is misleading. ❖ ❖

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WHO WOULD DECLARE that tissues examined microscopically were
❖ "microscopically negative," if the sections were poor, the staining
❖ poor, and the microscope lenses out of focus? Why be less exacting
❖ with a radiographic diagnosis? ❖ ❖

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BUT LET US INTERRUPT this soliloquy and quote once more. Imme-
❖ diately after describing their technique, as above, Drs. Nickel and
❖ Crich proceed as follows: ❖ ❖

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"THE GLUCOSE-BRAIN-BROTH CULTURES are injected into rabbits
❖ as soon as possible after they have grown out, generally within
❖ eighteen hours. From 5 to 10 c. c. is injected intravenously, de-
❖ pending on the size of the rabbit. Sometimes such an injection is
❖ repeated once or twice, depending on the effect on the rabbit." ❖

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I VISITED AWHILE once on a farm, where the owner raised, sold, and
❖ prescribed for poultry. He prescribed for poultry that he never had
❖ seen. The owner of the sick fowl sent in a list of the symptoms, and
❖ a dollar, and received in return, medicine appropriate for the
❖ chicken's disease. Believing that my friend really knew nothing of
❖ medicine, for man, or beast, or fowl, one day I asked him by what
❖ process he prescribed. "Oh! Well," said he, "I know most of these
❖ chicken troubles from the symptoms. You see I raise a great many
❖ myself. Now, I give the fowls the same remedies that I use for my
❖ children and family, only I make the dose proportionate." "What
❖ do you mean by that?" I asked. "Why, say that a hen weighs four

❖ pounds, I make the dose one-tenth as large as I give my forty pound
❖ boy." Simple to be a hen doctor, when you know the secret, isn't it?

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NOW LET US APPLY my poultry friend's method to our rabbit prob-
❖ lem. Five c. c. of this glucose-brain-broth culture to a little rabbit,
❖ and 10 c. c. to a big rabbit. I am not really posted on the weight
❖ of rabbits, but I opine that a ten pound rabbit, would be a big rabbit.
❖ If then a ten pound rabbit needs 10 c. c. of this pure culture to pro-
❖ duce the desired disease, a hundred and fifty pound man would
❖ need 150 c. c. of a pure culture to acquire the same disease. Can
❖ you imagine microörganisms in the focus at the end of a tooth
❖ root equal in number to those in 150 c. c. of culture medium? Of
❖ course, such a quantity might be absorbed in time, quite a long time.
❖ But the rabbit "gets his," in one dose. And not by slow absorption
❖ either. It is injected right into some vital spot in Br'er Rabbit. Poor
❖ Br'er Rabbit! No wonder you get sick! ❖ ❖

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BUT JESTING ASIDE, and harking back to the word "analogy," is there
❖ really any analogy between this inocculation of rabbits with such
❖ mammoth doses of pure cultures of microörganisms, and the seepage
❖ into the system of microörganisms from the end of a tooth root?
❖ If the two processes are analogous, present company is wofully
❖ ignorant of what analogy means. ❖ ❖

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I SINCERELY HOPE that our distinguished Colleagues will not think
❖ that I underrate their sincere efforts to solve this great problem, nor
❖ that I fail to appreciate the vast and painstaking labors necessary to
❖ prepare such a paper as they have given us. The point merely is
❖ that I am at variance with them as to what they have proven. If
❖ they would but claim that their experiments validate Rosenow's
❖ claims as to the selective affinity of definite strains of Streptococci
❖ for definite organs, or for the initiation of definite diseases, I stand
❖ ready to admit the importance of their deductions. But that the
❖ inocculation of an animal with pure cultures from a diseased root
❖ end, and the subsequent appearance of the expected disease in that
❖ inocculated animal, proves that the original disease in the original
❖ human patient was caused by that diseased tooth, does not appeal
❖ to me as proven. Does not appeal to me as an analogous procedure.
❖ But then, of course, perhaps I am just stupid. And that reminds
❖ me of a story that is very **apropos.** ❖ ❖

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A CERTAIN FOREIGN DIPLOMAT at Washington had aroused the
❖ ire of a certain newspaper correspondent. Said Correspondent had

called said Diplomat every possible vile name that his paper would print, and the Diplomat had smiled; just smiled. But came a time when the Correspondent called him a "Fool," at which the Diplomat flew into a violent rage. Then the Diplomat's friend asked why he had endured all the other epithets, and then became so angered at this last. And the Diplomat, who was no Fool, replied and said: "When he called me a Liar, or a Bigamist, or a Murderer, or what not, I could smile because I knew it was not true. But when he says I am a Fool, how do I know but that he may be right?" 1926.

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LXV.

AND NOW if the members of the Club, will pardon a reminiscence on my ❖ own part, I will relate an incident of which I am reminded by the ❖ experience recorded by a correspondent. He tells me that his cousin, ❖ after wearing a set that he had supplied, over forty years, declined to ❖ permit another man to make her an "Up to Date" set. The patient ❖ was wise in her day and generation. ❖ ❖

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I REMEMBER VERY WELL that my old Preceptor, Dr. Norman W. ❖ Kingsley often said to me: "Ottolengui, when you deal with elderly ❖ patients, don't try new fangled notions on them. Just keep them ❖ comfortable. 'You can't teach an old dog new tricks'." ❖ ❖

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NOW FOR MY REMINISCENCE! Once on a time, a Prominent ❖ physician,—all young dentists always tell you of Prominent patients ❖ that come to them, so why not I? Anyway the physician was Promi- ❖ nent, and he did come to me, and he had a favor to ask. I should ❖ mention that he was likewise a social friend. He described his favor ❖ as follows: ❖ ❖

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"MY MOTHER," said he, "has a set of teeth that she has worn for thirty- ❖ five years. They have been broken and repaired; teeth fractured ❖ and replaced; broken again and repaired again, and finally her ❖ dentist told her they could not be repaired any more. That in short ❖ she must have a new set. Well, the new set was made. And they ❖ certainly are beautiful. And they fit! Oh Yes! We cannot deny ❖ that they fit. In short there is only one fault with the new teeth. ❖ Mother will not wear them!" ❖ ❖

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I ASKED why not, and was told that he did not know. And all the Old ❖ Lady would say was that they were "Not Comfortable." Now I ❖ knew who had made those teeth. And he was a Prominent dentist, ❖ and he had a technician associated with him, who certainly was a ❖ Prominent Technician. Knew all about "three point contact" and ❖ the "Bonwill articulator," both of which were the talk of the times ❖ in those days. Small chance there seemed for me to succeed, when

these two Prominent men, the Dentist and his Technician, had scored a failure—well perhaps I should not say failure. "The operation was a success, but the patient—wouldn't wear the teeth."

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THINKING IT OVER I concluded to telephone to the Prominent dentist and ask what the trouble might be. Answer came right straight back. "Those teeth are absolutely all right. Up to Date." Wow! "But the patient says she can't wear them," I ventured timidly. "She is old, and like all old folks, unreasonable. She wants the new teeth to feel like her old ones, that is all. She is the sort of woman who takes off her new shoes and puts on her old ones as soon as she gets into the house. And then won't go out in the street because she would have to wear the new shoes." Then an idea seemed to strike him, and he kindly added: "If you are thinking of trying your hand on making her a set of teeth, it is all right with me. If you can satisfy the lady, I am sure I shall be glad of it."

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SO I TOLD the physician to bring the Mother in to see me, and to bring me the old set and the new.

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AFTER THE PHYSICIAN had left my office, two thoughts kept dancing in my brain (or in the place where the brain ought to be). First Dr. Kingsley's declaration, "You can't teach an old dog new tricks." Was this up-to-date set of teeth a new trick? Next, the Prominent dentist had said, "She wants the new teeth to feel like her old ones!" Well, why not?

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WHEN THE OLD LADY was brought in I began as follows: I placed her old set in position, had her close her mouth, and then firmly waxed the two dentures together with sticky wax, and removed them attached to one another. Then I placed the new set in, and waxed them together in the same manner. After removing these latter, I measured with calipers from the under side of the lower denture to the upper side of the upper denture, and recorded the distance on a card. Similar caliper measurements were made at three points on the new set, and also on the old.

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THESE CALIPER RECORDS demonstrated that the new set, the up-to-date set, opened the lady's jaws almost half an inch. Imagine, if you can, using a set of teeth for thirty-five years, and then being fitted to a set that opened the jaws to that extent! Think of the tired muscles that Dear Old Soul must have suffered from, trying to get accustomed to her "nice new teeth!" Put yourself in her

place if you can! You wouldn't have worn those new teeth yourself, no, sir! Not even if you had made them yourself, for yourself.

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THEY WERE NOT COMFORTABLE!

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WELL, I MADE her a new set of teeth. And I did not use a Bonwill articulator, though I had one, and had been taught how to use it by Dear Old Bonwill himself. And I paid very little attention to "three point contact." But I carved, and fitted, and fitted and carved my bite rims, until they calipered exactly the same as those old teeth, that the lady hated to part with.

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NO USE TO prolong the tale. My set of teeth were nothing near as good looking as those the Prominent Technician had made. The articulation was not near so good. And, of course, they were not "Up-to-date." But—they were comfortable, and the old lady wore them until she died. I think she died about three years later! But even so she had three years of comfort with a new set of teeth, that were "like her old ones."

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THE ABOVE is not a Brag. It is the relation of an important fact. The enunciation of a principle that never should be overlooked when dealing with elderly folks. "You can't teach an old dog new tricks." Serve such people so that they will be comfortable as long as they live, and remember that they probably are not going to live so very long anyway.

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THE FOLLOWING is a sort of connecting link between operative dentistry and prosthodontia. It is a method carried out in the laboratory for the later convenience of the man at the chair. Some months ago, speaking of the capping of pulps, it was recommended in one of these talks, to place a concaved disk of iridio-platinum over the paste used as the actual pulp cap, before covering both with a hard setting cement. The idea was to have the edges of the disk rest on sound dentin and thus prevent pressure against the more or less elastic dentin that might still cover the pulp tissue.

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SHORTLY AFTER we received a letter of general comment on various matters, from Dr. William H. Nitschke, of Utica, N. Y., in the course of which he described the following method of making disks:

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"YOU MAY BE INTERESTED in the way in which I prepare the concave disks of metal which you suggested for the protection of the

pulp. With the thirty-six gauge metal placed upon a block of lead, innumerable contoured disks can be punched out in a short time by using the open end of a small cone socket handle as a punch. A tap with a mallet or hammer supplies the force. I believe that 22 K. plate, or even German silver, or platinoid would be equally effective in so small a piece." 1927.

COMMENT. In Talk No. LIX, Dr. Nelson makes a plea for the utilization of modern articulators in full denture work, but he tells us that they should be called "adaptable" or "adjustable" rather than "anatomical" and he further declares that there is no such thing as an anatomical articulator and never will be because "it is manifestly impossible to reproduce all the anatomical features of the human being in metal."

THE CHIEF PURPOSE then of an adaptable articulator is to determine, as nearly as possible, the proper occlusal plane, and the distance between the edentulous jaws that will render dentures serviceable and comfortable. But this is not always easily done, even with the most adaptable articulators that science has produced.

THE UNDERLYING PRINCIPLE involved in the case history recounted in this Talk, is that when a patient has comfortably worn a full denture, that particular denture can be utilized to give us the correct occlusal plane and depth of the denture. Moreover it is a principle that I have used many times with gratification. Another Case History will serve to accentuate this.

THE PATIENT had been wearing a full upper denture, and a partial lower denture for several years. The lower denture had gradually been made to carry more and more teeth as the natural organs were lost from periodontoclasia. When seen, she had left only the two bicuspids on the right side, and the cuspid and one bicuspid on the left. These few teeth, in themselves were of course no index to the correct occlusal plane, nor to the depth of the upper denture. Moreover it would have been next to impossible to obtain correct casts of the lower arch, since the four remaining teeth tipped badly and were unduly long because of the recession of the gum. Nevertheless they were quite firm and could be used for a considerable time to aid in retention.

THE FOLLOWING fact is material to the use of this principle. The

upper denture had been made when a number of natural organs were present and had occluded properly with them. Moreover they had been worn with comfort for several years.

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IT IS MANIFEST then that this upper denture registered the correct occlusal plane, as well as the proper depth of the denture. A new denture made in duplicate of this one, would not only produce a serviceable denture, but would at the same time serve as a guide when articulating the lower teeth. The procedure was as follows:

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AN UPPER PLATE was swaged up in gold. Had I been making a vulcanite plate I should have vulcanized a roof plate, carrying no teeth, to be used in building up the bite rims. On this gold plate a bite rim was built up, and carved to the proper fullness for the lips. Then, with calipers and carving tools, the bite rim was made to be identical in length at all points with the denture that the patient had been using.

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THIS PARTICULAR case was so difficult, that the procedure may be given in detail. I found it impossible, even by Dr. Kennedy's sectional compound method to obtain a satisfactory impression of the lower arch because of the length and position of the lower teeth. A metal tray was cut so as to pass the teeth and rest against the gums. With this an impression of the ridge only, was taken, and from the resultant cast a gold plate was swaged. This plate was then placed in the mouth, and plaster built around two of the natural teeth only, it being difficult to hold the plate down while taking the impression. A cast was made into this and a long tang with wire clasp was adjusted to that side. This served to hold the plate in position while the procedure was followed for the opposite side.

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WE NOW HAD a lower gold plate held in place with clasps, and it was easy enough to build up a bite rim that would occlude with the rim already built on the upper plate. These were tacked together, with hard wax, in the mouth, and then removed and mounted on an articulator. The upper teeth were set up by these guides, tried in to be assured of position, appearance and occlusion with the few teeth left and were then attached to the plate. This denture was then worn by the patient for a week, until we were satisfied that we had a serviceable, comfortable denture.

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AND IN EVIDENCE of the efficacy of this technique, it may be said that absolutely no alteration was made in the denture. The lower

❖ teeth were then set up to occlude properly with the finished upper,
❖ and success was immediate. ❖ ❖

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THE MORAL is that a denture that has served a patient successfully is
❖ a safe guide to the proper occlusal plane and depth of a new denture.
❖

1928.

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LXVI.

A PROMINENT OUT OF TOWN MEMBER of our Club has propounded the problem, "What is a partial denture, and what is a removable bridge?" Once before the same, or a similar question was asked, though differently worded, so that the Secretary at that time easily evaded making a solution. The query on that occasion was, "What is the difference between a partial denture and a removable bridge," and the Secretary, with a profound wink, made answer and said: "The difference usually is about $500.00."

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THE PRESENT PHRASEOLOGY compels a more adequate answer. Yet one's mind turns inevitably toward that time worn riddle, "When is a door not a door," the reply to which, as any school Miss could tell you is, "When it is ajar!"

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PROCEEDING ALONG similar lines of jest, we reach the question: "When is a jar not a jar?" The answer being, "When it is expected." Hence it follows that when it is unexpected that the door should be ajar the result would be a draft. Next in order is the inquiry, "When is a draft not a draft?" the solution of which problem is, "When it is a check." Then if you insist on knowing what a check is, I might tell you that a check is a hindrance, the exact opposite of which is known as a "help."

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YOUR MIND NOW HAVING been brought to the point where it can sequentially comprehend deductions from scientific argument, we return to the original query: "What is a partial denture?" and the answer is that a partial denture, when it is a scientifically constructed partial denture is a help. But contrarily, when a partial denture is only partially a denture, why then, when it is not functioning as a denture, it is a hindrance.

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THE EXPOSITION of the other half of the original riddle, "What is a removable bridge?" would be analogous. When a removable bridge is so scientifically constructed that during function it is a help to the entire organism, it is likewise a partial denture. On the contrary,

when constructed on purely mechanical, rather than therapeutic lines, it is only partially a denture, or a part time denture, in which case it is at all times—an abomination.

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THE CONSTRUCTION of a part time denture, being purely mechanical, is naturally relegated to a dental mechanic, and a dental mechanic is not a dentist. These "pieces," or "cases," or "things," are sent to the mechanic by men who are neither mechanics nor dentists. Their signs tell you that they are dentists; their cards tell you that they are dentists; their billheads tell you that they are dentists; but I tell you that they are not. In olden times they were called "tooth carpenters," which was a degradation of the carpenter, because your carpenter is a mechanic.

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NO! THESE MEN who sell part time dentures, in the old days likewise known as "partial plates," are not really, truly, dentists. All they do is to take the impression; any sort of impression. Then they may, or may not, pour the cast; usually not. But however that may be, all that the dental mechanic sees is the cast, and he constructs, if he is a good mechanic, a denture of some sort, that will fit that cast. Now be it recalled, borne in mind, and otherwise remembered, that a cast is an inert mass, that feels not; neither does it complain. But what would you? The mechanic has been given a "job," and he does his "job."

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THE NEXT STEP taken by the self-styled dentist is to "sell" that plate to his patient. This perhaps he accomplishes by filing the plate a bit here and there, and grinding the natural teeth a bit there and elsewhere. That plate "must go in," and that is all there is about it. Mr. Dentist Man has already set that fee aside, in his mind, for some definite purpose. But he cannot carry out that purpose until the fee is in his pocket. Hence the plate must go in the mouth. Go in the mouth! That is the prime requisite. That it should be comfortable, and that it should function, as the immortal Perlmutter has said so aptly, "Is something else again."

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BUT YOU ASKED about removable bridgework and partial dentures, and here I have drifted on to part time dentures. So let us drift back again. But a word more before we do that. The Secretary does not mean to intimate that all partial dentures made by dental mechanics are only partially dentures, or part time dentures, and the rest of the time hindrances. Not at all. When that sort of structure is delivered to the patient, the fault lies with the dentist, not the

❖ mechanic. If the dentist comprehends physiology, pathology and
❖ scientific restoration of partially edentulous human arches, and if he
❖ tells his mechanic what to do, and does not permit his mechanic to
❖ tell him what should be done, there is no reason why the coöpera-
❖ tion might not be mutually advantageous. ❖ ❖

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LET US THEN address ourselves to the problem from a new angle. Let
❖ us ask: "What is the primary fundamental principle involved in
❖ the construction of the partial denture, or the removable bridge, be-
❖ cause this fundamental principle is fundamental to both?" ❖ ❖

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THE FUNDAMENTAL demand of a partial denture, whether it be de-
❖ livered to the patient under the name of removable bridge, or partial
❖ plate, is that it shall restore his functional occlusion. We cannot
❖ here go very deeply into the consideration of functional occlusion,
❖ except to say that when we use the term functional occlusion, we do
❖ not necessarily mean a normal occlusion. Normal occlusion of course
❖ must be a functional occlusion, but one may have a functional occlu-
❖ sion which is nevertheless very far from being a normal occlusion.

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IT WILL SATISFY the exigencies of the present discussion to say that a
❖ functional occlusion, is an occlusion that will function; that will
❖ enable the subject adequately to masticate his food. It can be pro-
❖ duced in any mouth, because functional occlusion means, "the high-
❖ est efficiency possible during all the excursions of the mandible that
❖ are essential to the masticatory function." Note the language care-
❖ fully. The "highest efficiency possible," not with some imaginary
❖ set of teth, in some imaginary jaws, under imaginary or ideal con-
❖ ditions. But the highest efficiency possible with the teeth of your
❖ particular patient, plus the denture that you supply. ❖ ❖

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IF IN THIS manner you restore the man's functional occlusion you have
❖ accomplished all that is possible. You have done your full duty.
❖ To do less however is to fail in your duty. Provide a functional
❖ occlusion and you have done all that is possible. You can not re-
❖ store normal occlusion, with a partial denture, in jaws that never
❖ supported teeth in normal occlusion. ❖ ❖

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THUS THEN, with a partial denture, we endeavor to restore functional
❖ occlusion; with full dentures we may do better. We may provide a
❖ better functional occlusion than the man ever had with his natural
❖ organs. Perhaps, anyway! Not always, of course. ❖ ❖

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THIS BRINGS us nicely to the word "plate," because, as any patient will

❖ tell you, what a dentist calls "full dentures," are really composed of
❖ "an upper plate and a lower plate." Now then, upon what do these
❖ plates rest? ❖ ❖

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ALMOST ANY Professor of Prosthodontia will tell you, "the plates rest
❖ on the mucosa." Well, let that pass for a moment. ❖ ❖

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BUT SUPPOSE we change the question and ask, "What supports the
❖ plates?" Probably the same professors might make the same answer
❖ and say, "The mucosa." But that is incorrect, and this is a case in
❖ which terminology is important. ❖ ❖

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THE MUCOSA (don't take my word for it; look in any good work on
❖ dental histology) is a part of the mucous membrane. And the mu-
❖ cous membrane is the very attenuated membrane, which covers the
❖ soft tissues, which are commonly known as the "gum," though
❖ more accurately the gum probably includes the soft tissue and its
❖ mucous membrane. The Standard Dictionary declares that the
❖ "gum" is, "The firm fleshy tissue that invests the necks of the teeth
❖ and covers the adjacent portions of the jaw." Like nearly all diction-
❖ ary definitions, this leaves something to be desired. Still, it is evident
❖ enough that it is the "gum," and not the "mucosa," which supports
❖ the plate. ❖ ❖

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ONE DISTINGUISHED AUTHOR, whose work I had the honor of
❖ editing, absolutely refused to permit the use of this word "gum."
❖ Had a "hatred complex," or an "inhibition," or something, against
❖ the word. Said it always made him think of "gum copal," "gum
❖ damar," "gum arabic," "chewing gum," etc., etc. ❖ ❖

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THAT LAST STATEMENT opens the way nicely for a little joke, that is
❖ also meant in earnest. The natural gum should never be converted
❖ into a "chewing" gum. And that brings your mind into a receptive
❖ condition for the greatest truth of all; all the truths that I am en-
❖ deavoring herein to expound, I mean. ❖ ❖

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IT IS A WELL KNOWN and universally admitted fact that the use of
❖ full dentures causes, or results in, (causes—I guess, is correct) a
❖ slow but sure absorption of both gum and underlying alveolar proc-
❖ ess. The patient will tell you that his gums have "shrunk." Why
❖ is this? Because they have been converted into "chewing" gums.
❖ The gum never was intended to support the stresses of mastication.
❖ The stresses, and consequent strains of mastication, pass through the

long axes of the teeth, when they are present, and are transmitted to, and resisted by the alveolar bone, the pericemental membrane acting as a cushion, or shock absorber.

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THE GREAT TROUBLE with full dentures is that the extent of pressure upon the gum is regulated only by the degree of force exerted by the patient when masticating his food.

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THIS IS NOT TRUE of the partial plate; or rather it should not be true. Yet originally, of course, it was true. The word "partial plate" indicates that probably the first attempt to supply artificial teeth was after the subject had lost all the teeth of at least one arch. For him a "full plate" was made.

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AS A NATURAL EVOLUTION the time probably came when some dentist undertook to replace a few lost natural teeth, and this he did with a "partial plate."

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IT LIKEWISE SEEMS REASONABLE to suppose that these early partial plates, like the full plates that preceded them, were entirely supported by the gum, and we can just as reasonably suppose that the gums shrunk away under the partial plates, as they had done under full plates.

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ANOTHER DIFFICULTY must have been met in the problem of retention. The early partial plates likely were kept in place, to some extent at least, by what was then called "suction." Indeed I myself have seen many partial plates which covered the entire roof of the mouth, and which were ornamented in the central portion with a cavity formed by what was known as "air-chamber metal."

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BUT IT SOON was discovered that the air in the "air-chamber" would escape, allowing the suction to fail, and the plate to drop. Such plates were said to "leak," and the leaking would be just commensurate with the number of teeth supplied, each artificial tooth which passed between two natural teeth, causing an additional "leak."

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TO OVERCOME the dropping of partial plates the dentists of that day, or some of them anyway, resorted to what they called "spring plates." These men made up in mechanical skill, for what they lacked in knowledge of physiological tooth movement. The "spring plate" was constructed on a cast of the mouth, on which the necks of the teeth had been scraped, so that the plate would need to be forced

beyond the lingual height of contour, and rest tight against the necks of the natural teeth. To get such plates into position, whether made of vulcanite or of metal, it was essential that the plate should be thin enough in the case of vulcanite, and whether of vulcanite or of metal, elastic enough, to bend slightly by lateral compression when forced to place.

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THESE SPRING PLATES "stayed up;" long enough anyhow to collect the bill, provided there was not much delay about sending it.

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HOWEVER THE CONSCIENTIOUS dentist soon discovered that while a full plate could be constructed to remain in place rigidly enough for masticatory purposes, it was quite otherwise with the partial plate which depended either upon suction, or upon spring pressure against the lingual surfaces of the teeth. Some other method of retention was requisite.

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DENTAL INGENUITY soon evolved the clasp, and dental ingenuity has been inproving clasps ever since. With the advent of the clasp, the problem of making the partial plate "stay up" was solved; but the clasp, as first constructed did not solve the greater problem of making the partial plate "stay put," to borrow from the vernacular for just a moment.

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BY THIS APPARENT AMBIGUITY I mean that the clasp might prevent a partial plate from dropping down, but it did not prevent it from driving up, and yet further up, against the gum. With the clasp, as without it, it soon became apparent that gums shrink even more rapidly under partial plates than under full plates. That is to say with the earlier types of clasps.

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THE EARLIEST CLASP was probably what we term the flat clasp; a piece of flat spring metal bent to encircle the tooth. When it became apparent that the flat clasp might be a menace to the tooth structure, many cavities appearing exactly under the clasp, and of exactly the same width, the dentist learned that the less contact there might be between the clasp and the enamel, the less caries there might be.

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AS A RESPONSE TO THIS RECOGNITION clasps of wire came into vogue. With the wire-clasp the extent of caries was lessened, but the destruction of the subjacent tissue, the gum, continued merrily on. Gums continued to "shrink." Absorption still progressed.

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THEN ARRIVED BONWILL, with the final solution of the problem, even though he himself did not appreciate the depth of his dogma. The solution of the problem was the so-called "occlusal lug." Yet various men, even in this day and generation, define the uses of the occlusal lug in various ways.

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SOME PROSTHODONTISTS declare that the primary object of an occlusal lug is to act as do the approximal contact points in natural teeth, and prevent the forcing of food into the embrasures, and against the interproximal gum. Others tell us that the occlusal lug is a stabilizer, and gives a firmer grip to a clasp, by causing the clasp to grip the tooth on three surfaces, thus avoiding lateral rocking. Still others tell us that without the occlusal lug, the partial plate is what they call "tissue bearing," which is true; but that with the occlusal lug, the plate becomes "tooth bearing," which is not true, or rather, Woe is me! it too often is true, but should not be true.

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I HAVE ALREADY said that the primary demand of a partial denture, whether a partial plate, or a removable bridge is that it should restore functional occlusion; and I have said that functional occlusion is the highest masticatory efficiency possible. To round this out, and really indicate the most important primary demand of a partial denture, let me state now, that functional occlusion must be obtained with the minimum chance of injury to the teeth and to the subjacent soft tissue, commonly known as the gums.

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HOW SHALL THIS be accomplished? Let us suppose that the dentist has taken an accurate impression of the partially edentulous arch, and that from this impression he has obtained an accurate cast. Note that I do not say absolutely accurate, because that would be an impossibility. Yet this fact does not excuse the grossly inaccurate casts that some dentists send to their mechanics.

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WITH A CAST that is as nearly accurate as possible, let it be presumed that we construct a partial denture, with clasps and occlusal rests. If such denture fits the cast it will fit the patient's arch, but, it will be a "tooth bearing" structure. The impression of the saddle area having been taken with the soft tissue, or gum, in a state of rest, the cast necessarily represents that area in a state of quiescence; that is to say without compression. A denture constructed on such a cast will touch the surface of the gum, at the same time as the occlusal rests touch the teeth. As soon as the patient attempts to masticate his food, he forces the structure towards the gum, but not any more tightly against that tissue, because the occlusal rests cause all the re-

sistance to stress to be borne by the abutment teeth. This is therefore a "tooth bearing" denture.

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IF THE CLASPS, in this type of structure, are cast clasps, the danger is increased. A cast clasp necessarily does not rest entirely below the height of contour, and consequently grips the tooth occlusally of its widest dimension, thus adding to the resistance of toothward thrusts, and compelling the abutment teeth to support the denture at all times, and to endure the entire burden of mastication during that process.

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IT IS FURTHER manifest that if this be true of a denture sustained by one or two cast clasps, the danger is greatly accentuated if the denture and clasps are all cast in one piece; and that the injury to the natural teeth will be exactly proportionate to the rigidity of the structure, and will be further accentuated by the number of clasps and the extent of tooth surface in contact with these clasps.

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WHER LIES THE remedy? The remedy lies in procuring a cast in which the saddle area represents the gum tissue under the fullest possible compression. This may be accomplished in at least three ways. Perhaps the most certain method is to obtain, first, the usual impression and cast. On this, construct the saddle and the clasps. Return to the mouth, test the fit of each clasp and perfect its adaptation. It is best to do this one clasp at a time. Insert the saddle, and perfect the adaptation, making sure that it does not unduly press against the gum at any point along its edge. Next cut a fairly stout pine stick, just long enough so that one end may rest against the saddle, and the patient may then close the antagonizing teeth against the opposite end and force the saddle firmly against the gum, thus compressing the soft tissues to the fullest normal extent possible without injury. Take an impression of saddle and one clasp while thus rigidly held. Pour a cast with an investment compound, and solder the clasp to the structure at the chosen point. Repeat this process for the additional clasp, or clasps.

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A SECOND, and thoroughly reliable method of obtaining saddle compression is to use Dr. Kennedy's rebasing impression technique, recently so well described and illustrated. A third and in some cases entirely adequate method is to press a pledget of cotton saturated with adrenalin chlorid against the saddle area, for five or ten minutes, and, having thus shrunk the gum, take an impression quickly.

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BY EITHER of these methods we may produce a denture with occlusal lugs which will only come into actual contact with the abutment teeth when masticatory stresses force the denture down, to the extent of the compressibility of the soft tissues. For fear that this may not be entirely clear, let us suppose that the cast was poured in an impression taken by Dr. Kennedy's rebasing technique, or after the gums have been shrunken with adrenalin chlorid.

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SUCH CAST would represent the saddle area as it appears when the soft tissues are compressed; the saddle, and the occlusal lugs would touch the cast at the same moment. But transfer this denture to the mouth, and the resiliency of the soft tissue would lift the denture slightly, so that there would not be any actual contact between the lugs and the occlusal surfaces of the abutment teeth.

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WHEN THE JAWS are passive such a denture would be what is called "tissue bearing." That is to say, it would rest against the gum, but this would cause no damage, because no pressure would be exerted.

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JUST AS SOON, however, as mastication should begin, the denture would be pressed gumward, and of course also toothward; but because our cast represented the gum at the stage of full normal compression, the denture would be pressed downward, only to the extent of the normal resistance of the soft tissue, (because at exactly that moment the occlusal rests would cause the abutment teeth to take up their share of the burden), and no further, and therefore no deleterious pressure could be exerted against the gum.

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AS PREVIOUSLY stated, this fundamental principle is dominant in all scientifically constructed partial dentures, whether removable bridge, or partial plate. In the removable type of bridge, for example, the male member of the slotted attachment, contrary to the opinion of some men, does not touch the bottom of the female part, when the denture is at rest. Having been constructed on a cast which represented the soft tissues compressed, the resiliency of these soft tissues lifts the denture slightly, and the male part only contacts with the bottom of the box when pressed against the soft tissues by masticatory stresses. And exactly the same is, or should be true, of a correctly planned and correctly constructed clasp denture.

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THE TERMS "tissue bearing" and "tooth bearing" therefore, have no valid use in physiologic partial denture restorations. Whether partial plate, or removable bridge, the partial denture should be supported

by the soft tissues, and by the abutment teeth, the burden being so divided, and so disseminated, that neither tooth nor tissue would be forced to endure an overload, with consequent injury.

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THUS WE SEE that whether we construct a removable bridge, or a partial denture the dominant desideratum, aside from supplying a functional occlusion, is that the plate, or the saddle, or the superstructure, call it what you will, should rest upon the gum until brought under the stresses of mastication, at which time, as soon as the gum has been compressed to its normal extent, the strain should be upon and the burden shared by the abutment teeth.

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TO OBTAIN SUCH a result requires a nicety of technique in taking impressions and in adjusting the attachments, which perhaps is difficult to acquire. Yet the possession of such skill is well worth while; is well worth the patience required in its acquirement. It means the ability to supply your patient with a denture that will function without damage to living tissues. 1927.

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LXVII.

OUR ESTEEMED MEMBER Dr. Fred D. Miller of Altoona, Penna., has contributed some thoughts upon "The Temporary Filling; Its Importance in Pulp Conservation." He writes:

"THE FOLLOWING is a brief outline of the method of procedure when a new patient is being examined. First, visit to dental hygienist for a thorough prophylaxis, during which procedure the hygienist makes a chart of the cavities which can be discovered by the use of instruments, explorers, etc. Next a set of Bite Wing film radiographs are taken, and these are carefully studied by myself, and notations made on the chart, of areas that are to receive attention. At the first appointment which the patient has with me, all of the cavities are opened up and cleaned out, and temporary fillings made with oxid of zinc (C.P.) mixed to a stiff paste with eugenol (Merck). This temporary filling material is to my mind the best temporary cement I have ever used; it is non-irritating, sedative, antiseptic, easy to manipulate and stays put remarkably well. If the cavity is deep, and there is leathery decay I use Howe's silver nitrate in all posterior cavities precipitating with eugenol.

"I CLASSIFY CAVITIES into three classes: First Class, fissure cavities; Second Class, deep-seated cavities involving approximal surfaces; and Third Class, teeth with extensive decay that have ached, or are sensitive to thermal changes. These cavities are always called to my attention by the hygienist and are stopped up by me before the patient leaves the office after her first visit to the hygienist. This procedure requires only a few minutes, will prevent many toothaches, and will do more to conserve the dental pulp than any other procedure that I know of.

"LEAKY AMALGAM FILLINGS are also removed and the decayed underlying tooth structure sterilized with ammonical solution of silver nitrate and eugenol, and filled with oxid of zinc and eugenol.

"I ALSO USE BASE PLATE gutta-percha as a temporary stopping, where there is extensive involvement of the walls of the teeth, because it

stands up very well, and will resist the stress of mastication better in very large cavities than oxid of zinc and eugenol. I am indebted to Dr. Milton J. Waas of Philadelphia, for a stunt in the manipulation of this material. You know that base plate gutta-percha requires a very high heat to manipulate it, and this is very objectionable in hypersensitive teeth. Dr. Waas suggests that the proper quantity of base plate gutta-percha be heated very hot, and just before placing in the cavity tempered in chloroform, for just a few seconds; this prevents pain when inserting in the cavity, and also makes it much more plastic and easy to manipulate.

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"AS THIS BRIEF communication is to be on temporary fillings, I will describe several other methods that I use in this work. I am firmly of the opinion that we have no right to allow any cavity to remain open and exposed to the secretions of the mouth for any period of time. The dentin should be protected, and our enamel margins must be covered. For instance, suppose that in constructing a gingival inlay we have prepared the cavity under procain anesthesia, and we desire to place a temporary filling in this cavity. Temporary gutta-percha is very good but not a sedative; oxid of zinc gets very hard and is difficult to remove; a little chloropercha added to the oxid of zinc, or flowed into the cavity will facilitate its removal.

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"FREQUENTLY IN MY PRACTICE for one of the following reasons, I desire to set an inlay temporarily. First; when time alloted to the patient does not permit proper finishing. Second; when I am constructing an inlay bridge and have one abutment completed and wish to set it temporarily until the other is completed. It is a surer protection to the margins than any temporary filling material. Third; when I have capped an exposed pulp and am not sure that the operation will prove a success. Fourth; when a tooth is hypersensitive to thermal changes; an inlay set temporarily is easy to remove, and in the event of trauma which aggravates this condition, the grinding can be done out of the mouth, or the bulk of gold can be reduced on the inside of the inlay to prevent thermal shock. In all of these cases, I set my inlays with chloropercha, occasionally chloropercha and oxid of zinc and eugenol mixed to thin paste. It is wise to keep a record of these inlays that have been set temporarily, as you might forget. I have had an inlay in the mouth of a dentist friend of mine, set with chloropercha 5 years before, and when it was removed the underly tooth structure was in good condition. I would not advise its use to replace cement, but it certainly is mighty handy for temporary use.

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"OTHER TEMPORARY CEMENTS, such as a Calxine are occasionally useful. This material is mixed very thin and sets very quickly. Cotton incorporated with it facilitates its removal, or chloropercha flowed in the cavity first.

"THE INCORPORATION of cotton fibres with oxid of zinc and eugenol makes a very durable temporary filling, but is quite difficult to remove."

OUR TABLE TALK for November has brought in several questions, and as others who have not taken time to write may desire the same information, the answers may as well be recorded here. One Member asks, "What solution of adrenalin do you use before taking impressions of saddle areas?" The solution is used as it comes from the pharmacist, and the label tells us that it is 1 to 1,000 solution.

ANOTHER MEMBER writes, "Suppose that you have a case with teeth missing on both sides of the mouth, and also in the incisor region. In such conditions it would appear to me that shrinking the gum in the saddle areas will not accomplish your purpose, since the various parts of the denture are united, or connected by bars crossing from one side of the arch to the other. What then?" In such cases the saddle areas are treated with adrenalin just the same, because during mastication the stress will be greater on one side than on the other. However, with a denture passing across the mouth an additional precaution should be taken. The occlusal surfaces of the teeth to be clasped would be covered with heavy tin foil, which should be burnished into the grooves which are to receive the occlusal lugs. Lugs made to fit over this tin foil will not quite permit the denture to rest upon the natural teeth, until masticatory stress is exerted.

I SINCERELY TRUST that the above answer to our out of town Member will not be misconstrued, misunderstood, misconceived, or misstated in repetition. I use the many and various words to express myself, because it appears that some of our members do not comprehend the Secretary's language, unless said language is rendered in words most comprehensible. He is tempted to quote from a character in that odd comedy, "Forty-Five Minutes from Broadway," said locality being I believe at, or near, or within the boundaries of New Rochelle. Finding it difficult to make the natives understand him because he talked strictly "New York," in exasperation he turned aside and remarked, under his breath, "Gee! You have to talk Baby-talk to these folks."

AND NOW LET ME EXPLAIN, under my breath, that in the answer to our correspondent I am not advocating that he should supply his patient with a clasp denture. But I do admit that I am trying to tell him a better way of constructing a clasp denture, if he and his patient, severally and jointly, decide that he must construct a clasp denture.

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POSSIBLY I AM MAKING MYSELF even less comprehensible than usual. Perhaps I am "putting the cart before the horse," so to speak. Perhaps you are saying to yourself, "What the deuce is he talking about?" Well then!

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PROBABLY THERE is nothing that will so quickly eradicate the conceit from a man, than to produce some "stuff," as Elbert Hubbard used to call it, which he thinks is above the average, (above his own average anyway) and then to have a friend, a real Friend too, tell him that his "stuff" is "rotten." I know what I am talking about because that is just what has happened to me. I really harbored the notion that our last Table Talk was "good stuff." That certain scientific and well worth while ideas had been expounded, as they never had been expounded before, and that on the whole the monologue might render a service to those constructing, or called upon to construct, removable bridges, or partial dentures, one or both.

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BUT I MUST HAVE BEEN in error. At all events all my conceit in the matter evaporated after receiving the following: "As your Friend I want to tell you what a bad impression your last Table Talk has made. Your previous public utterances had made your friends believe that you had accepted and adopted the scientific principles involved in Chayes removable bridgework, and here you fill several pages with rotten stuff advocating clasped dentures. I am shocked. Your Friend, X. Y."

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PERHAPS MY FRIEND, (X. Y. admits he is my Friend) has misunderstood me, but I surely do not misunderstand him. He says that my "stuff" is "rotten." Hardly need turn to the dictionary to comprehend that. Now what to do! I must either shut up like a clam, or try again. Think I'll try again. After all, the writer says he is my Friend, and one hates to be misunderstood by a Friend. So let us "up and at it."

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FIRST THOUGH, a little story which may pave the way to my being better understood this time. "Once on a time," as all good stories begin, there was a man; a man of the Husband type. The sort of

❖ Husband who is constantly educating his wife, teaching her rules of ❖ conduct and broadening her mental vision with philosophic plati- ❖ tudes. Then one morning he helped himself to some six or more ❖ griddle cakes, each of which he buttered liberally. Then over the ❖ pile of cakes he poured a generous flood of maple syrup. At which ❖ friend Wife, "up and spake," so to speak. Said she, to friend Hus- ❖ band: "You set a fine example to the children. Always preaching ❖ economy and then you use both butter and syrup on your cakes. ❖ Such extravagance!" ❖ ❖

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UPON WHICH, with a peeved and pained expression, the Husband ❖ made answer and said: "Isn't that just like the logic of a woman. ❖ Can't you see, my Dear, that I am using the strictest economy? Am ❖ I not making one batch of cakes do for both my butter and my ❖ syrup? Well then!" ❖ ❖

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THE SCENERY always varies in accordance with the viewpoint. Look- ❖ ing south one may see beautiful plains and fertile valleys. Looking ❖ north the eye sees naught but mountains. ❖ ❖

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I FANCY THAT MY Friend X. Y. was looking north. I also rather ❖ think that he made mountains out of molehills. However, let us ❖ particularize. ❖ ❖

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HE DECLARES THAT I "advocated" clasped dentures. And in self- ❖ defense I enter the plea "not guilty." Of course I read that Table ❖ Talk in the manuscript. Again in what we call galley proof. Again ❖ in page proof. And finally, after receiving word from my Friend ❖ that my "stuff" is "rotten," and that I have "advocated" clasped ❖ dentures, I have read it over for a fourth time. Ah! Perhaps that ❖ is the explanation! Perhaps my language is so obscure that one must ❖ read it four times to comprehend it, if then. ❖ ❖

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AT THE FOURTH READING, however, I do not yet discover that my ❖ "stuff" is "rotten." And I am human enough to sympathize with ❖ another member of the Club who writes: "Let me thank you for ❖ the November Table Talk. I learned from it, more of the essential ❖ principles of partial denture construction, than I ever learned from ❖ text-books or from teachers." Maybe he read it more than once. ❖ Seems likely. ❖ ❖

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ON MY OWN FOURTH READING I watched out carefully for the ❖ place where I "advocated" clasped dentures. Odd fact, but I just

❖ can't find it. Am almost tempted to read it over a fifth time. But
❖ that might appear as though I like reading my own "stuff," and be-
❖ lieve me I get rather sick of doing that. I solace myself with this
❖ thought, "it cannot be that I 'advocated' clasped dentures because
❖ that was not the object of the talk at all." What then was the ob-
❖ ject? ❖ ❖

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IT WAS TWO-FOLD. First, dental writers, and prosthetic workers, in
❖ recent years, have done a lot of writing and a lot of talking about
❖ the "mucosa," when in reality they meant the soft tissue, or gum, of
❖ which the mucosa is only one layer. When men talk about dentures
❖ that are "supported by the mucosa," either they do not mean what
❖ they say, or they do not say what they mean. Such language is
❖ most confusing. Even more so than my own. ❖ ❖

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THE SECOND OBJECT was to enunciate the tremendously important
❖ principle that a partial denture should be neither "tooth bearing"
❖ nor "tissue bearing," to use two more phrases now in common use.
❖ And now let my Friend prepare for a shock. That Table Talk was
❖ addressed quite as much to the disciples of Dr. Chayes as to any
❖ of the "advocates" of clasped dentures. I know whereof I speak,
❖ for I have seen innumerable Chayes bridges in which the male mem-
❖ ber of the attachment was in contact with the floor of the female
❖ member, and not even arked. Only last summer a teacher of this
❖ type of construction published a paper in a prominent dental journal,
❖ which convinced me that the writer makes "tooth bearing" structures.

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HERE THEN WAS THE REAL PURPOSE of the talk. A survey of the
❖ field of partial denture construction, appatently brought out the fact
❖ that this great principle, probably first enunciated by Chayes, is very
❖ little understood. The advocates of cast clasps, and especially den-
❖ tures of the so-called "one piece casting" type, certainly make den-
❖ tures that are "tooth bearing," and which in time must prove dis-
❖ astrous. Those who are teaching the use of wrought clasps of var-
❖ ious types, are mainly constructing their dentures with such arrange-
❖ ment of occlusal rests that these structures likewise are "tooth bear-
❖ ing." ❖ ❖

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AND WORSE YET, and Woe is me! Chayes movable removable bridge-
❖ work and likewise other types of removable bridgework are being
❖ supplied with the attachments so snugly fitted to the bottoms of their
❖ receptacles that those bridges likewise are "tooth bearing." Men
❖ who make such dentures do not seem to have grasped the under-

lying principle, which I endeavored to elucidate in the following words:

"WHETHER PARTIAL PLATE, or removable bridge, the partial denture should be supported by both the soft tissues, and by the abutment teeth, the burden being so divided, and so disseminated, that neither tooth nor tissue would be forced to endure an overload, with consequent injury."

NO, MY FRIEND, and all other Friends, I did not advocate clasped dentures. But then neither do I advocate amalgam fillings. I believe in the movable removable bridge, just as I believe that a gold filling is better than an amalgam filling. But such a statement must be modified. The best gold filling is better than the best amalgam filling. But a bad gold filling is certainly not as good as a good amalgam filling. Consequently one must use judgment to decide upon a choice between the two. If the locality renders a good gold filling impossible; if the patient's nervous system would not endure the strain of inserting a gold filling, or the preparation needful for a perfect gold inlay; if the patient's financial position renders it impossible to place a good gold restoration, why then it seems to me perfectly ethical to "temper the wind to the shorn lamb," and to render the best service possible considering the cavity to be filled, the sensitiveness of the tooth, the sensitiveness of the patient, and the patient's finances, even though such service be done with amalgam.

FIRMLY BELIEVING that the above principle is sound, and that we should be prepared to render "the greatest good to the greatest number," I should not be ashamed to write a paper, doing my best to tell how, when and where to fill teeth with amalgam. Moreover I should resent the implication by any one, even a Friend, that I advocate amalgam for filling teeth. I do not advocate amalgam; I never have done so, but I do at times fill teeth with amalgam.

IN LIKE MANNER I do not advocate clasped dentures, and also in like manner not infrequently I do make such dentures for my patients. This is neither the time nor the place to tell why I do this. But as I do also know that thousands of clasped dentures are made annually, I am not ashamed of trying to tell men how to make better clasped dentures.

IT WAS NOT THE PURPOSE of the November Table Talk to advocate clasped dentures. My Friend misunderstood. Perhaps he resented

❖ the talk because clasped dentures were even mentioned. Somewhat
❖ as in the story of the Minneapolis mob that went across to St. Paul,
❖ raided the book-stores, collected all the Bibles, made a pile of them
❖ in a public square and kindled a bonfire. Later the leader of the
❖ mob declared that they had burned the Bibles because the Bible
❖ mentions St. Paul, and says nothing about Minneapolis!" 1927.

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LXVIII.

THE CORRECT CONSTRUCTION of partial dentures, with special reference to their support by the teeth, or by the soft tissues, or by both, seems to have attracted considerable attention. Dr. S. Korol, of Chicago, has written a letter which will be spread before the Club for consideration and discussion. He asks a number of quite pertinent questions, and requests me to answer them. I am not at all sure I can do so to his satisfaction, or to the satisfaction of our other members. I shall do my best, and perhaps where the argument is inadequate, some of our prosthodontia specialists will aid us by expressing their views. Dr. Korol writes thus:

"THE FIRST THING I turn to upon receiving 'Dental Items of Interest' is the 'Around the Table' discussion. The main attraction is the clear and entertaining way in which subjects are presented.

"BUT IN THE DISCUSSION on partial plates, in the November issue you failed to make yourself entirely clear to me, and, as the subject is a very important one, I hope you will not mind explaining a point which puzzles me.

"IF I UNDERSTAND YOU, the trouble about partial plates was (and is) that if a partial plate is tissue bearing it causes absorption, and if it is tooth bearing it destroys the abutments. Your remedy is in taking the impression under the 'fullest possible compression.'

"LET US SEE. You say that a lugless plate causes absorption, which is true. Now, as the lugless plate to begin with cannot compress the gum more than the 'fullest possible compression'—it follows that when the gum is continually subjected to such pressure absorption results.

"WITH YOUR METHOD, because you have taken the impression under the fullest possible compression, the gum in mastication is subjected to the same pressure as a lugless plate, and consequently absorption will follow. While a lugless plate, as a result of absorption will move

gumward—the lugs in a lug-plate will prevent it from doing so. If so, the lug-plate will cease to be supported by the gum very shortly, and will become a tooth bearing appliance. I cannot see how the burden is 'so divided that neither tooth nor tissue would be forced to endure an overload.'

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"YOU STATE THAT in mastication the denture would be pressed 'only to the extent of the normal resistance of the soft tissue.' I do not know how you determine the normal resistance of the gum in taking the impression, but it must be the same as 'fullest possible compression' as you use both terms interchangeably, and this, as I have said, seems to me to result in absorption. 'And then' you say 'the teeth will take up the burden'—in other words it becomes a tooth bearing appliance when stress becomes greatest.

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"AS YOU SEE, my difficulty is in failing to understand the benefit derived from taking the impression under 'the fullest possible compression,' and how it is possible in a lug-plate to divide accurately the stress between the gums and abutments without injury to either.

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"I WOULD APPRECIATE a personal reply or further discussion in 'Around the Table' if you deem it of sufficient importance."

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THE FOLLOWING BRIEF REPLY was forwarded to Dr. Korol:

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"I THANK YOU for your letter and shall be very glad to discuss the points which you raise in another Table Talk. Temporarily, however, I may say this; if a denture is tissue bearing only, the stress against the tissues will be continuous and so will the absorption of bone under it. If the plate is tooth bearing only, the stress will be continuous on the tooth, with the result of the same type of injury to the teeth which are clasped, as we see in connection with traumatic occlusion. Of course any kind of plate in the mouth is a menace to the living structures. I have only been trying to indicate a way of making this menace as slight as possible. The ideas and methods are not original with myself."

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AND NOW, PERHAPS WITH SOME PROFIT we may take up Dr. Korol's questions seriatim, and endeavor to arrive at mutual comprehension of the facts, because as Dr. Korol says, "the subject is very important."

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ALMOST AT THE OUTSET, or so it seems to me, Dr. Korol drifts into an error. He says: "Now, as the lug-less plate to begin with cannot compress the gum more than the fullest possible compression, it follows that when the gum is continually subjected to such pressure absorption results."

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THIS WOULD BE IMPORTANT if true, but I think it is not true.

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IN A PREVIOUS paragraph Dr. Korol correctly quotes as follows: "Your remedy is in taking the impression under the fullest possible compression." Dr. Korol has misapprehended the meaning of this statement, and perhaps the statement would have been more lucid, if otherwise expressed. But as the time of writing I had not considered the possible misinterpretation. Dr. Korol having raised the point, I am happy to discuss it further.

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JUST WHAT DO THE WORDS "taking the impression under the fullest possible compression mean?" They mean, not that the gum shall be under the fullest compression possible but that it shall be under the fullest compression possible when taking the impression.

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TO RENDER THIS still clearer, we must analyze the situation. By what methods are these "compression impressions" taken? Dr. Herman Chayes recommends the use of adrenalin chlorid. This "compression," is perhaps not a "compression" at all, but rather a shrinking of the tissue, by the chemical action of the adrenalin. Dr. Kennedy advises his rebasing impression technique, which means taking an impression with compound, placing a wafer of impression compound in the saddle areas, after the primary impression has hardened, and returning to the mouth and taking a secondary impression, using force with the fingers in seating the impression. Naturally this force will not, and cannot be comparable to masticatory force.

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THE METHOD which approaches nearest to producing the extreme limit of compression is that where the saddle is made on the primary impression, then placed in the mouth, and a second impression taken while the patient closes the jaws upon a pine stick which rests between the saddle and the antagonizing teeth. Such a process will probably give us the greatest possible compression obtainable by any impression method, and is adequate for our purposes.

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BUT THIS DOES NOT represent the utmost compression that might and would be exerted during mastication. It has been shown that as

❖ much, or more than eighty pounds pressure to the square inch may
❖ be exerted by the human jaws. When the patient holds a saddle
❖ tight in position by biting upon a pine stick he probably enables us to
❖ obtain the normal limit of compressibility, at the moment, but not
❖ the limit of compressive force that he can and does exert during
❖ active mastication. And it is the continuous abnormal compressive
❖ force which does the damage and hastens bone absorption. Or so
❖ it seems to me. ❖ ❖

✣ ✣ ✣

DR. KOROL AND OTHER MEMBERS will perhaps ask, "why do you
❖ speak of the normal masticatory force as exerting abnormal com-
❖ pression?" The answer is that, during mastication the individual,
❖ closing say with a pressure equal to 80 pounds to the square inch,
❖ meets the resistance of the natural teeth in their sockets. To them
❖ the compressive stress is not abnormal, because nature has designed
❖ a superstructure of bone, with a cushion of pericementum between it
❖ and the tooth root, which root, as Dr. Chayes tells us, "moves in
❖ function." The masticatory stress therefore is normal for the nat-
❖ ural teeth. ❖ ❖

✣ ✣ ✣

THE SAME DEGREE of masticatory force, exerted against a denture
❖ which is "tissue bearing," might be abnormal. Would be abnormal.
❖ The compression of the tissues would be greater than that obtainable
❖ by either of the impression methods indicated. Hence, having
❖ reached the normal resistance of the tissues, the denture should then
❖ be brought to rest through occlusal lugs coming into contact with
❖ the teeth, and thus producing a resistance, analogous to that afforded
❖ by the natural teeth; a resistance borne by the tooth sockets. ❖ ❖

✣ ✣ ✣

DR. KOROL goes on to say, "because you have taken your impression
❖ under the fullest possible compression, the gum in mastication is
❖ subjected to the same pressure as a lugless plate." This is entirely
❖ logical from Dr. Korol's understanding of what I mean by "fullest
❖ possible compression," but I hope I have made it clear that during
❖ mastication there would always be greater compressive force exerted,
❖ than can occur during any impression method. ❖ ❖

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WITH THIS POINT CLEARED UP it becomes evident that Dr. Korol
❖ is again mistaken when he says that, "the lug-plate will cease to be
❖ supported by gum very shortly, and will become a tooth bearing
❖ appliance." There is little doubt that this is apt to be the end result
❖ in all partial dentures, but not "very shortly" as Dr. Korol fears.
❖ It may occur eventually, because, very likely, there will be absorption
❖ and settling of the denture in time, for the reason that edentulous

❖ bone is in a state of continuous atrophy, as a rule. But this absorp-
❖ tion will not occur so rapidly, if excess burdens of masticatory stress
❖ can be avoided, by having the lugs support the denture at, or just
❖ prior to, the limit of endurance of the soft tissues. ❖ ❖

✣ ✣ ✣

FINALLY DR. KOROL says: "I do not know how you determine the
❖ normal resistance of the gum, etc.,' I may say truthfully, "Neither
❖ do I." I merely predicate the fact that it is desirable to so balance
❖ the resistance that the burden of stresses will be shared equally by
❖ teeth and tissues. The nearer that we can come to achieving this,
❖ the longer, in my opinion, will the partial denture serve well. It is
❖ worth trying for, at all events. ❖ ❖

✣ ✣ ✣

ANALOGOUSLY I might ask Dr. Korol, how do you know when you
❖ insert a "permanent filling?" Yet you and I often tell patients that
❖ the filling is a permanent filling. ❖ ❖

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WHAT WE REALLY mean is that, not having used materials that we
❖ know to be temporary in character, we are inserting what we hope
❖ will prove permanent, or as permanent as anything is in this life. ❖

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SIMILARLY I hope that I supply my patient with a more permanently
❖ useful denture when I endeavor to make the natural teeth and the
❖ gum share the burden. At least I can comfort myself with the
❖ knowledge that it is not a tissue bearing structure, nor a tooth bear-
❖ ing structure, both of which I know, sooner or later will be dis-
❖ astrous. 1928.

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LXIX.

IN CONNECTION WITH the subject of tissue constriction for saddle areas, Dr. Scheiman has written us a letter. Referring to the recommended use of adrenalin chlorid on the gums, prior to taking impressions, he asks just how the adrenalin causes a contraction of the tissues, and especially expresses a desire for an opinion from Dr. Herman Chayes. Dr. Chayes has kindly answered the question, as follows:

"COMPLYING WITH YOUR REQUEST for a short communication on the use of adrenalin in the constriction of tissues for teeth impressions, I am herewith giving you the salient facts:

"TO BEGIN WITH, it is well known today that the extract secreted by the suprarenal bodies contains, among other things, an agent which acts as a vasoconstrictor. This constriction is followed after a brief period by dilatation of the blood vessels thus acted upon, and this dilatation is the natural reaction taking place in normal tissue as a response to inhibition.

"INHIBITION AND AUGMENTATION, or constriction and dilatation, are the opposite poles of the same thing, namely the opposite poles of circulatory action. The extent of the influence which this vasomotor agent has on the tissues is proportionate to the permeability of the tissue; that is, to the ability of the tissue to take it up. This ability of tissue to subject itself to constrictor action, varies in different individuals, and in different parts of the same individual, and while the whole of the action may be due to the shrinkage of the cell itself, as stated by your correspondent, it in no way affects the ultimate end of the process.

"PERMEABILITY of cell structure is the prime factor in the ability of the cell to adjust itself to immediate requirements brought into being by external or internal stimuli, and life as a whole is not dependent on the resistance to disease, but rather on permeability of cell struct-

❖ ure, or, put in other words, on the ability of the cell to remain con-
❖ tinuously in a state of osmotic efficiency. ❖ ❖

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"THE MUCOUS MEMBRANE of the mouth need not be broken, nor
❖ cut, in order that adrenalin may exercise its vasoconstrictor action on
❖ the subjacent tissues, as well as on the membrane itself. There are
❖ cases on record where severe swellings have been caused by placing
❖ in the mouth liquid agents, which were readily taken up by the cells
❖ by means of osmosis. These swellings were unaccompanied by pain,
❖ or temperature, and were merely the effect of increased volume,
❖ caused by the readiness of the subjacent tissues to take up large
❖ quantities of these fluid agents. In like manner, the tissues will, in
❖ proportion to their ability to harbor the agent, take up vasoconstric-
❖ tor materials, and the effect of this will register in a volume change
❖ of the structures in the oral cavity. ❖ ❖

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"I HAVE BEFORE ME three saucers of exactly the same dimensions and
❖ capacity. One is made of agate, one is made of marble, and one is
❖ made of standstone. I now pour into each saucer one ounce of
❖ water. I allow this water to stand in these saucers for a period of
❖ twenty-four hours. Upon measuring the liquid contents the next
❖ day, I find an apparent evaporation of about one-eighth the quantity
❖ in the agate saucer, one-fourth the quantity in the marble saucer,
❖ and three-fourths the quantity in the sandstone saucer. It must be
❖ evident to you that evaporation has been equal in all the saucers,
❖ and that the difference in quantities was due to absorption by the
❖ material holding the water, or shall we say, due to the permeability
❖ of the materials of which the last two saucers were made. ❖ ❖

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"THE POINT OF GREAT IMPORTANCE in the use of adrenalin for
❖ the purpose named, is the fact that we thus obtain the amount of
❖ constriction suited for the particular individual for whom we are
❖ making the appliance. It is unnecessary to definitely measure this
❖ constriction in micromillimeters, because it will be found to be
❖ different in each individual, and the point to remember is that we
❖ obtain by these means the maximum degree of physiological con-
❖ striction, never going beyond the elastic limit of the underlying mem-
❖ branes or cells. ❖ ❖

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"A CELL CANNOT take up a sufficient quantity of adrenalin to endanger
❖ the possibility of its coming back to normal, because having taken
❖ up its maximum quantity, which is something determined by the
❖ cell structure itself, it will reject, or refuse, any further attempt to

force an additional quantity upon it. This is a matter of natural defense, in exactly the same way that if an overdose of poison be given to an individual, vomiting spells will occur.

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"THIS APPLIES of course only to topical application of the agent mentioned.

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"IT IS NECESSARY to leave the adrenalin in contact with the tissues for a period of about sixty seconds, and ample time will be provided for the impression to be taken, because the tissues of the particular individual will remain constricted for a period long enough to allow the impression material to harden with the tissues under a self-imposed pressure, yet not endangering its elastic limit.

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"I HOPE I have made myself clear; I have tried to do it as briefly as possible, and you are at liberty to use this explanation as you will."

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IN A POSTSCRIPT, Dr. Chayes adds a few lines that seem important. He says: "I omitted to mention that the absorption of liquid agents may take place in the mouth by way of the gingival crevices in the environmental tissues around the teeth." 1928.

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LXX.

IN THE JANUARY ISSUE, Brother Thadeus P. Hyatt presented a little paper entitled "A Prophylactic Catechism." Nice title, don't you think? You do? So do I. But Brother Thad either does not know the game, or else he does not play the game. Now be it known that Thadeus is of English ancestry, and the English always "play the game." They always "carry on." Certainly Brother Hyatt has "carried on" in regard to odontotomy. Hence it follows that it must be that he does not know the game.

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YOU ARE WONDERING what game I am talking about! Well, in this Prophylactic Catechism, Brother Hyatt asks a number of questions. Now it is well known to all and sundry that this question game is called "The Game of Twenty Questions," and Thad only asked nineteen. Hence it follows that one is naturally curious to know what the twentieth question might be. Well, as no other member rises to suggest one the Secretary will venture to supply the lapse, and ask, and of course answer, the missing question.

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THE LAST QUESTION on Brother Hyatt's list read as follows: "Are we justified in treating, or filling, every fissure, or pit, in teeth in children under 14 years of age? If yes,—A. Why? B. When? C. How?" And the answer was: "Yes. A. Because decay can start at the bottom of pits, or fissures, without any external evidence. B. As soon as possible after the eruption of the tooth. C. With a gold, or an amalgam filling and a Class I cavity preparation."

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FOR QUESTION NO. 20, the Secretary suggests the following: "When no decay is actually visible in a fissure is there any material better than gold for filling the prepared cavity?" Answer. "There is. The best quality of silicate cement is far preferable to either gold, or amalgam, for filling fissures, where decay has not progressed sufficiently to be visible."

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TO THOSE WHO believe in the theory of prophylactic odontotomy, be

❖ it known that silicate cement is the Prophylactic Filling, par excel-
❖ lence. ❖ ❖

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THERE NOW! THE SECRETARY'S HAT is in the ring, and he must
❖ follow and retrieve it. Brother Hyatt tells us that these fissure cavi-
❖ ties should be filled as soon after eruption as possible. Indeed I
❖ would go further and declare that where the fissure is readily pene-
❖ trated with an explorer, the filling should often be done long before
❖ the tooth has fully erupted. ❖ ❖

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IN THE CASE of first molars, that would mean between the ages of
❖ five and a half and seven. Children as young as that should have
❖ their teeth filled with the irreducible minimum of cutting, essential
❖ to the placing of a safe filling. The preparation of a Class I cavity
❖ would often be a great tax on both patient and operator. ❖ ❖

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WHEN I MADE answer to Question 20 and said that the silicate cements
❖ are better in fissure cavities than gold or amalgam, some of you
❖ Brothers smiled, shrugged the shoulder and wondered how I could
❖ recommend such a temporary material for permanent work. ❖ ❖

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BUT WHY AND WHERE is silicate cement a temporary filling? It is
❖ more or less temporary in mouths where the fluids are of such a
❖ character that the cement is dissolved out. And of course, being
❖ exceedingly brittle it is a poor filling for corners in the labial teeth,
❖ and for occlusal cavities in the buccal teeth. ❖ ❖

✣ ✣ ✣

"MY! MY!" YOU SAY: "He admits that, yet he recommends the sili-
❖ cates for filling fissures!" Just so. I do. ❖ ❖

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THE SILICATES SERVE but a temporary purpose in occlusal cavities,
❖ but not in occlusal fissures. Such fillings are temporary in occlusal
❖ cavities because being brittle, they are readily chipped along the
❖ margins, thus inviting decay and general disintegration. But a fissure
❖ is not a cavity, and should not be made into a cavity. As we shall
❖ see. ❖ ❖

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THE SILICATES are temporary in some mouths, because the mouth
❖ fluids are capable of dissolving the silicate cements. But a silicate
❖ cement filling, properly placed in a fissure, is not readily dissolved,
❖ even in mouths where the same material proves to be very easily dis-
❖ solved in other localities. ❖ ❖

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ALL OF WHICH seems very mysterious, does it not? Well it is presented in this mysterious manner in order to attract your attention. In order to make you weigh the evidence and reason it out for yourselves. The Stage Wizards and Legerdemain Men do many mysterious things from the viewpoint of the audience, that are very simple to those behind the scenes. Let us then reduce these seemingly contradictory statements to simple comprehensible terms.

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YEARS, AND YEARS, AND YEARS AGO, when teeth were filled with "bone fillings," said bone fillings being composed of a cement called "os artificial," the fillings were less conspicuous than gold, but far less durable. Why? Because they were soluble in the oral fluids.

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IN THE HOPE of finding a filling material approximating tooth structure in color and appearance, our manufacturers made strenuous efforts and cements were improved and improved, until we finally arrived at the period of the oxyphosphate cement. This material was often used for filling teeth, but note that it is always called a cement. Why?

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BECAUSE OXYPHOSPHATE is more durable when used as a cementing medium, than when inserted as a filling.

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YET IT IS AN ODD FACT that the silicates, which are intended for filling purposes, and which have little or no value for cementation, with but a single exception are called silicate "cements."

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BUT RETURNING to oxyphosphate, why is it more permanent as a cement than as a filling? This fact was first discovered when the material was utilized for placing shell gold crowns, and even dowel crowns. The filling being exposed to the oral fluids dissolved. Protected from moisture by the shell crown, disintegration never occurred.

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THEN ARRIVED the period of the inlay. First porcelain and then gold. At the outset, many were skeptical because they looked for solution of the cement at the joint. But this did not occur, or rather it was soon learned that the permanency of the cement was in exact ratio to the narrowness of the joint. What is the explanation of this seeming phenomenon? If cement is soluble in the oral fluids, and if it is exposed to the oral fluids when used in connection with inlays, why does it not dissolve out?

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THE SECRETARY HERE has the temerity to venture into the domain of physics, and to offer a theory. Solution cannot occur without motion. If one could imagine a soluable substance immersed in a solvent of that material, but absolutely static, that is to say without motion, solution would not occur. But there is always motion, due to the movement of the earth.

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THAT SOLUTION DEPENDS upon motion is easily shown by the commonplace experience with sugar. Sugar will dissolve in coffee, but if we are in a hurry, we stir with a spoon. We add to the slight motion transmitted through the movement of the earth, and the solution of the sugar is hastened, in proportion to the acceleration of the motion.

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APPLYING THIS KNOWLEDGE to our cement filling, we see that the cement is dissolved in proportion to its accessibility, and to friction caused by the motion of the oral fluids. Hence a filling will dissolve in proportion to the area of its exposed surface, for which reason the cement between an inlay and a tooth is not dissolved as rapidly as the same type of cement would dissolve, if used for filling a cavity.

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IT IS EVEN CONCEIVABLE that if a joint could be made so narrow that fluids could not enter and move about, solution would not occur. This is found to be true in practice as well as in theory. A joint so close that the cement is invisible, is pracitcally permanent. But given a slight defect along the inlay margin, which permits the cement to be visible, and solution is not only invited, but the invitation is generally accepted.

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THUS WE SEE that silicate cement, though stronger and less soluble than oxyphosphate cement, is temporary in proportion to its friability and its exposure to the oral fluids.

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FRACTURE OF MARGINS of silicate cement fillings will depend upon the width of the filling, the slant of the cavity margin, and the stress that it must resist. It is evident then, that a silicate cement filling, inserted into a cavity that has axial walls at a right angle to the pulpal floor; which has an extremely narrow exposed surface; and which is not in close contact with the cusps of occluding teeth, will be less likely to chip along the margins, than would a wide filling, in a cavity having beveled margins, and elevated to actual contact when in occlusion.

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IN REGARD TO DESTRUCTION OF a silicate cement filling by solution, it has been shown that, as with any cement, solubility will be in proportion to the area of surface exposed to the action of the oral fluids.

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CONSEQUENTLY, A SILICATE CEMENT FILLING, inserted in an extremely narrow cavity, which has axial walls at a right angle to the floor, and which, after completion is not in actual contact with occluding cusps, is, to all practical intent, a permanent filling. It can be more closely adapted to all walls of the cavity; it is less of a conductor of thermal shock than are the metals, and is a better match in color to the teeth. Hence in fissures in occlusal surfaces in the buccal teeth, the silicate cements serve better than either gold or amalgam, especially when we recall that we usually do this work for children, and that the insertion of such fillings is less difficult for both patient and dentist.

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PERSONALLY I HAVE NEVER been a friend of amalgam in young teeth. You may ask as others have asked: "Why do you use amalgam in teeth of adults if you would not use it in the mouths of children?" The answer is that in the mouths of adults I generally find some amalgam already in place, and have an opportunity to note how well, or how ill it serves in that particular environment. Very few children come to me with amalgam fillings from ten to twenty years old. Ha! Ha! and likewise Ho! Ho!

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BEING AS I ADMIT, prejudiced against the use of amalgam for children, when I could not insert gold, it was, for many years, my practice to use pink base-plate gutta-percha, as a temporary filling, until the tooth should erupt sufficiently to enable me to use the rubber dam.

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WITH THE ADVENT of the more nearly perfect silicate cements some years ago, I was tempted to use this material as a temporary recourse in the occlusal surfaces of children's molars.

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WITHIN A VERY FEW YEARS I learned that the silicate cement, in occlusal cavities, is indeed temporary, where the fillings have a large surface area; more temporary than base-plate gutta-percha. But I also learned that the silicate cement filling is permanent in fissures, provided the fissure is not enlarged.

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ABOUT THIS TIME arrived a New Apostle, with a new doctrine. Per-

haps I should say a new, old doctrine. Brother Hyatt attracted our attention with, "Prophylactic Odontotomy." The High Priests of this cult tell us, "Fill the fissures whether decayed or not."

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SELA! THE PROBLEM WAS SOLVED. I had only to classify, coördinate and utilize the knowledge already acquired. These not-yet-decayed-but-perhaps-soon-to-decay fissures, are just exactly the situation for the silicate filling. The technique is as follows:

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ALWAYS REMEMBER that I am talking of fissures that have no visible evidences of decay, and that we are practicing prophylactic odontotomy. Remember also that the fissure is a fault in the enamel. That if the enamel had joined along the bottom of the sulcus, we would have had a groove with a smooth bottom. But, not having joined, the result is a fissure, into which a fine explorer may be made to enter.

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SUCH FISSURES, having no visible decay, should not be converted into cavities, of Class I, or any other class. They should be permitted to remain fissures, only we must widen them a little. In widening a fissure, we should remember that we wish our silicate cement to be exposed along as narrow a surface as possible. The fissure therefore should be made wide enough for us to fill it with silicate cement, and absolutely no wider.

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WE ARE IN the position of the Irishman who, finding a hole in his pants, cut the hole out.

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THAT IS ALL that we should do; cut the hole, or the fissure, or ditch, just wide enough for the reception of silicate cement. This is accomplished with the tiniest of tiny burs. The bur is forced into the widest pit in the fissure; the place in which we were able to catch the point of our needle point explorers. Then, the rotating, new, sharp bur is slowly forced along the fissure, throughout all its ramification, until our fissure has been made equally wide at all parts. I might also say equally narrow.

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I HAVE THUS PREPARED some fissures, which when prepared, curved and twisted exactly in the same form as before a bur entered it.

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NEXT PUDDLE the silicate cement into and along the slightly widened ditch. "Puddle" is the correct word. Often this can only be done with patient use of the same explorer with which you found the first point of entrance to the fissure. The cement must be "puddled" in,

because it must be packed solidly to obtain a homogenous filling. Hence the cement must be mixed slightly thinner than for approximal cavities.

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I HAVE TAKEN two or three fairly large, ball burnishers, and have ground the balls into pineapple shaped points, and then repolished them. Just before the cement begins to crystallize, I run the point of my pineapple shaped burnisher along the surface of the filling, following all the original ramifications of the fissure. This done, permit the cement to set, without further instrumentation. At a subsequent sitting, two or three days later, the filling should be polished with very smooth polishing paper disks, coated liberally with cocoa butter.

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WHEN COMPLETED, such filling should be practically invisible. Indeed with this technique, you do what Nature failed to do. You produce a smooth bottomed groove, where you started with a fissure. In the vast majority of cases the filling will not reach contact with the cusp, or cusps, of the occluding tooth. In sound teeth this is always true. When the natural teeth are closed, there is a space between the cusps and the grooves at the bottoms of the sulci. This groove formation is produced by the pineapple shaped burnisher.

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MANY SUCH FILLINGS originally inserted by myself, as temporary work, the intention being later to replace them with gold, are still in the mouth two, three, four and five years after placing them. Indeed in such cavities, or widened fissures rather, I have not as yet found it necessary to refill a single tooth.

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IN THE TECHNIQUE DESCRIBED we have all the factors that make for permanency, that is to say permanency as far as a cement filling can be permanent. The material is not apt to dissolve, because so little of it is exposed to the oral fluids. These narrow silicate fillings are far less likely to dissolve than the oxyphosphate that may be seen along a defective inlay margin. The margins of the fillings do not crumble, partly because of the strength afforded by the shape of the walls, and partly because masticatory stress is reduced to a minimum.

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IF I HAVE HAD such success in filling fissures with the silicate cements of yesterday, what may we not hope for with the silicates of today?

1928.

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LXXI.

IN CONNECTION with the advice to fill undecayed fissures with silicate cement, puddled in and polished with sandpaper disks, we have received the following letter from Dr. R. F. Lence, of Webster Groves, Mo. He writes:

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"I READ in Around the Table your method of filling occlusal fissures in nearly erupted teeth. You state that after opening the fissure with tiny burs, you puddle the silicate cement to place and then polish the same with fine sandpaper disks.

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Fig. 1

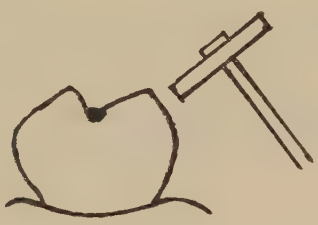

Fig. 2

"FOR THE good Lord's sake how do you do it?

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"HERE IS a cross section of one of your occlusal fissure silicate filling, (Fig. 1), also picture of a sandpaper disk on a mandrel, of course with the abrasive on one side only. Now how?

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"HOW IN H—— (H of course stands for Heaven) are you going to polish a fine streak of silicate in a fissure at the bottom of a sulcus made by the tapering sides of the cusps, with the abrasive on the side of the disk?

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"LET ME make a suggestion, as to how to do it successfully; the only way I can possibly figure it out. If there is any other way, please let me know.

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"FIRST ANESTHETIZE the parts with a local anesthetic. Then take a heatless stone and grind the cusps, (Fig. 2). Keep this up until you have ground away the cusps to the extent shown in Fig. 3. The tooth then will look something like Fig. 4. A good deal of enamel will be destroyed and considerable dentin exposed, but what of that? We must polish that puddled silicate occlusal filling. Otherwise it might waste away.

Fig. 3

Fig. 4

Fig. 5

"FOR THE FINAL polishing of the silicate, at last we can use the sandpaper disk, holding it as shown in Fig. 5.

"LATER, should the tooth become sensitive, the pulp can be removed and a crown placed over it. But your silicate filling will be smooth.

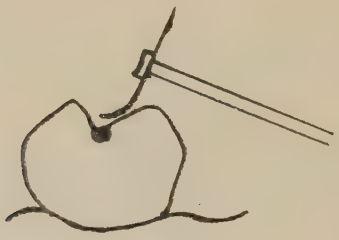

Fig. 6

"NOW I WANT TO KNOW how you polish this fissure filling with sandpaper disks. You say you do it, so tell us how."

I AM INDEBTED to Dr. Lence for indicating the weak point in the original description, and I gladly tell him how I do it. Like him I must resort to a picture.

GLANCING ONCE MORE at the first picture in his series (Fig. 1) we see what he tells us is a sandpaper disk on a mandrel. But so far as the

❖ picture goes, it might be a steel separating disk. Or a Jim Dandy
❖ disk, or any other disk of rigid material. Unfortunately the picture
❖ is what the Movie Men call a "Still." Were it a motion picture we
❖ would at once see that when revolved a sandpaper disk is not neces-
❖ sarily so stiff and straight. I advised a fine disk. This disk is al-
❖ ways on flexible and rather thin paper. With slight pressure it may
❖ be made to curl up, as in Fig. 6 (sorry again it is not a "Movie").
❖ Now as this rotates, the disk curls more and more and, strange to say,
❖ it does remove excess silicate and does polish the fine streak. ❖ ❖

✣ ✣ ✣

BUT DR. LENCE speaks of there being abrasive on one side only. This
❖ objection is readily overcome. Use two disks on the mandrel, back
❖ to back. This makes your disks more rigid, but with a little pressure
❖ the edges will curl nicely, and polish the silicate. ❖ ❖

✣ ✣ ✣

THIS DOUBLE disk method is also admirable for polishing sulci in gold
❖ inlays. But all jesting aside, the disk is needed, not so much for
❖ cutting, as for carrying the cocoa butter. 1928.

✣ ✣ ✣

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